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THE MATERNAL MORTALITY STUDY IN MASSACHUSETTS FOR 1937 . . . 865
Roy J. Heffernan

CESAREAN SECTION IN MASSACHUSETTS IN 1937 . . . 871
Robert L. DeNormandie

THE SMALL OBSTETRIC HOSPITALS IN MASSACHUSETTS . . . 879
Joseph C. Merriam and *Robert H. Goodwin*

THE DIAGNOSIS AND CONSERVATIVE TREATMENT OF ACUTE PANCREATITIS . . . 881
Rolf Lium

PULMONARY TUBERCULOSIS IN OLD PEOPLE . . . 885
Mark H. Joress

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL . . . 888

EDITORIALS
A Year-Round Dividend . . . 895
Broader Program Needed to Stamp Out Syphilis . . . 895

DEPARTMENTS
Massachusetts Medical Society . . . 896
Correspondence . . . 897
Notices . . . 898

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MASSACHUSETTS MEDICAL SOCIETY

Section of Obstetrics and Gynecology

THE MATERNAL MORTALITY STUDY IN MASSACHUSETTS FOR 1937*

ROY J. HEFFERNAN, M.D.†

BROOKLINE

A STUDY of the maternal mortality in Massachusetts has been started by the Division of Child Hygiene of the Massachusetts Department of Public Health in conjunction with the Section of Obstetrics and Gynecology of the Massachusetts Medical Society. It will include all deaths that occur in the five-year period 1937-1941, from conditions associated in any way with pregnancy among women with legal addresses in Massachusetts or who lived outside the State and died in Massachusetts.

As it is planned to carry this work through 1941, the Commissioner of Health has appointed a permanent committee of members of the Section of Obstetrics and Gynecology of the Massachusetts Medical Society to assist the Department of Public Health, so that continuity and permanence of working personnel will be assured. The members of this committee have been ably assisted in this investigation by an advisory committee of doctors specializing in obstetrics and situated throughout the State. The commissioner has also designated a physician in the Department of Public Health to examine every death certificate on file in the Secretary of State's office for these years, especially those which have any possible association with pregnancy. It is his duty to send data on all such deaths to the committee mentioned, for subsequent investigation. A letter is sent from the Department of Public Health to each physician whose name appears on a certificate, appraising him that a member of the Massachusetts Medical Society will interview him in relation to the death. No physician is interviewed until this letter has been sent. The investigators are all primarily interested in obstetrics.

The information sent from the State House to the committee and passed on to its investigator is printed on a comprehensive questionnaire published by the Children's Bureau of the United States Department of Labor (C. B. 122, revised 6-1937). The questionnaire covers the prenatal care given, the frequency of prenatal visits, physical examination, Wassermann tests, complications of pregnancy, type of delivery and type and classification of hospital, and inquires in detail into the actual cause of death.

After the letter from the State House has reached the physician whose name appears on the death certificate, the investigator arranges for a personal interview, usually over the telephone. This meeting is held in the physician's office or occasionally at a hospital, and intimate details of the case are thus obtained that could be secured in no other way. The questionnaire is carefully filled out, and when it is intelligently answered and the replies are wisely digested, an honest opinion of the care given the patient is made possible.

It is hoped that this year and the years following the cases may be followed up within two months at most after the patient's death. It has been found that if these interviews are held soon the facts are much clearer in the attending physician's mind, and in consequence early investigations are much more valuable.

The questionnaires when completed are returned to the committee by the investigators. They are reviewed and analyzed, and the correct diagnoses are allocated to the proper rubric of the International List of Causes of Death.

*Presented at the annual meeting of the Massachusetts Medical Society, Boston, May 31, 1938.

†Vice-chairman, Section of Obstetrics and Gynecology, Massachusetts Medical Society.

* * *

Table 1 shows the maternal mortality rate in Massachusetts for the ten years 1927-1937. During the last four years there has been a very gratifying decrease in the number of puerperal deaths.

Table 1. *Maternal Mortality Rates in Massachusetts, 1927-1937, per 1000 Live Births.*

YEAR	MORTALITY RATE	YEAR	MORTALITY RATE
1927	6.3	1933	6.7
1928	6.4	1934	5.4
1929	6.8	1935	5.7
1930	6.4	1936	4.9
1931	6.5	1937	4.1
1932	6.0		

When the total deaths are adjusted for non-residents and non-puerperal causes, — a final figure of 252, — the mortality rate in the State during 1937 becomes 4.1 per 1000 live births, or 0.41 per cent.

Table 2. *Causes of Maternal Deaths, 1937.*

CAUSE	NO. OF CASES
Sepsis	112
Medical complications	57
Embolus	34
Hemorrhage	30
Albuminuria and eclampsia	29
Accidents of labor	13
Surgical complications	11
Abortion, not septic	9
Anesthetic death	6
Ectopic pregnancy	6
Pernicious vomiting	4
Transfusion	3
Shock	3
Sudden death	2
Total	319

The causes of the 319 maternal deaths that occurred in 1937, and were investigated by the committee, are listed in Table 2, and a detailed consideration of these causes follows.

SEPSIS

Sepsis, as is usually the case, claimed the greatest number of victims during 1937 (Table 3). There were 41 deaths following abortions, and nearly all of these were induced. Although the problem thus presented is basically social, induced abortion is an important factor in maternal mortality in this state. The practice continues year after year, and some means should be considered whereby these women can be informed of the great risk it involves.

Table 3. *Deaths Due to Sepsis, 1937.*

TYPE OF DELIVERY	NO. OF CASES
Abortion	41
Normal delivery	22
Cesarean section	29
Version	6
Low-forceps delivery	7
High-forceps delivery	2
Mid-forceps delivery	2
Bag induction	1
Destructive operation	1
Unknown	1
Total	112

Although 21 women died after normal delivery, the study showed that many of these had had inadequate or no prenatal care. Possibly they began labor with secondary anemia and with lowered resistance to infection. There had been no opportunity to advise them against coitus during the last two months of pregnancy, and they had not been forbidden to take tub baths. Many of them entered the hospital with respiratory infections and an elevated temperature. These deaths cannot be charged against the medical profession. As a rule, the patients received good care during labor and intelligent efforts were made to overcome the infection.

As usual in septic deaths, virtually all the victims had had some operative interference. All investigations have shown that any operative interference prior to or during labor, or any invasion of the genital tract during the puerperium, carries with it increased danger of contamination, bruising of tissues and blood loss, followed by sepsis. The less unnecessary operating our patients receive, the better chance they will have of a normal postoperative course and of avoiding sepsis.

MEDICAL COMPLICATIONS

Table 4 lists the deaths from the medical complications of pregnancy. The pneumonia cases were on the whole handled well. In no case was the pregnancy interrupted because of the respiratory infection, a record that seems highly creditable.

Table 4. *Deaths from Medical Complications, 1937.*

CAUSE OF DEATH		NO. OF CASES
Pneumonia		20
	Undelivered	5
	Spontaneous delivery	11
	Miscarriage	2
	Cesarean section	1
	Forceps	1
Cardiac disease		20
	Undelivered	7
	Cesarean section	3
	Forceps	1
	Accouchement forcé	1
	Normal delivery	5
	Spontaneous abortion	3
Nephritis		7
	Spontaneous delivery:	
	5th to 6th month	2
	8th month	1
	9th month	1
	Hysterotomy, 5th month	1
	Labor induced by catheter, 6th month	1
	Miscarriage, 3rd month	1
Tracheobronchitis		1
Diabetes		1
Thyrotoxicosis		1
Pneumococcal meningitis		1
Peptic ulcer		1
Tuberculosis		1
Psychosis		1
Amebic dysentery		1
Acute parotitis		1
Otitis media and streptococcal meningitis		1
Total		57

Many of the women who died of cardiac disease had received inadequate or no prenatal care. In many cases there was a distinct lack of co-operation between patient and doctor. Sometimes the patient consulted her physician fairly early in pregnancy and did not see him again until decompensation had set in and she was seriously ill. We believe that there is a double responsibility in these cases, and that a patient with heart disease should be warned of her great danger if she fails to consult her doctor frequently and to follow his advice. Mitral stenosis was the heart lesion in most of the fatal cases. We regret to say that there was a high incidence of operative interference practiced on decompensated patients. Any such instrumentation should of course be avoided whenever possible. One patient was delivered by accouchement forcé. In this section it has been preached for years that the cardinal sin of obstetrics is interference during the first stage of labor. There is never any justification for interfering before the cervix has been fully dilated. This is true of patients with sound hearts, and it is doubly true if the patient has cardiac disease, pre-eclamptic toxemia or any other complication. It is an obstetric axiom that art can never imitate Nature in dilating and effacing the cervix. Some years ago it was common to speak of the "dilatable cervix." We now know that this conception is a fallacy, and that the welfare of both mother and baby is safeguarded by withholding interference until the natural forces of labor have dilated the cervix. Accouchement forcé therefore has no place in modern obstetrics.

Table 5. *Deaths from Embolus, 1937.*

TYPE OF DELIVERY	NO. OF CASES
Normal delivery (1 induced)	15
Cesarean section	8
Low-forceps delivery	4
Mid-forceps delivery	4
Curettage for incomplete abortion	1
Breech delivery	1
Unknown	1
Total	34

Under chronic nephritis we have classified those women who showed definite signs of kidney damage very early in pregnancy. These patients consulted their doctors in the second, third and fourth months, and were found to have marked hypertension, albuminuria and various other urinary findings indicating that they had chronic nephritis. Most of them died before the beginning of the third trimester.

EMBOLUS

Table 5 shows that 34 women died of embolism. These records were carefully scrutinized, and we believe that embolism was the cause of death in every case, although it was frequently difficult to be sure. Many of the patients had several complications of pregnancy. A great many of these deaths were of course inevitable, and constitute part of the irreducible minimum of maternal mortality. Some of them, however, can be prevented by limiting operative interference and avoiding sepsis. Embolism is more frequent in patients who are running a septic course, as a sterile thrombus is less apt to become detached and plug the pulmonary artery.

HEMORRHAGE

Sixteen of the deaths in the hemorrhage group (Table 6) resulted from postpartum hemorrhage.

Table 6. *Deaths from Hemorrhage, 1937.*

CONTRIBUTING FACTOR	NO. OF CASES
Postpartum bleeding	16
Placenta previa	7
Abruptio placentae	7
Total	30

Many of these women had had very little prenatal care and the deliveries were emergency births at home, without proper equipment for combating serious postpartum bleeding. Some deaths, however, occurred in hospitals, and an analysis of these cases disclosed a conduct of the third stage which was open to criticism. Not one of these patients, for instance, received pituitary extract intravenously. Two or 3 minims of the latter, diluted with 5 cc. of warm salt solution and given slowly by vein, will usually contract an atonic uterus very efficiently, and will obviate the necessity for packing or for continued credéing and manipulating of the uterus. Administered in this way, pituitary extract causes no harmful reaction. Most of the 7 patients who died from placenta previa had had inadequate prenatal care. Some of these cases, we regret to say, were treated by packing. We do not believe that packing, particularly at home, through an unshaved vulva, with improper aseptic conditions, is good treatment for placenta previa. We regret also to say that very few of the fatal cases were transfused. Safety demands that any patient with bleeding, particularly in the last trimester, should be hospitalized as soon as possible, and that arrangements for transfusion should be made at once.

Many of the patients who died from abruptio placentae were not treated according to the best modern standards. None of them received the conservative treatment of firm abdominal compression and rupture of the membranes, supplemented occasionally by vaginal tamponade. In 1 case a cesarean section was done with the patient almost exsanguinated and after the fetal heart had ceased

to be heard. We think that most of these cases can be treated more safely by conservative methods. By administering morphine and applying a firm abdominal binder or Spanish windlass the hemorrhage can be controlled. A few patients at or near term, with an undilated cervix and a live baby, are still best treated by cesarean section. Again, patients who have such a severe type of abruptio placentae that a real uteroplacental apoplexy is suspected should have an abdominal delivery, so that the uterus may be inspected and removed if it does not contract postpartum.

We emphasize again the need for more transfusions in the bleeding complications of pregnancy. In many of the smaller hospitals throughout the State we believe that it would be very helpful for a committee on transfusion to be appointed by the staff, so that transfusions could be promptly and efficiently performed at any hour of the day or night. In this connection it should be mentioned that it is not necessary to go through any surgical procedure in giving blood. A simple and efficient method is to start an intravenous infusion of normal salt solution and add the citrated blood to the last 50 cc. By this simple technic any physician or intern who is capable of giving intravenous medication, such as saline or glucose solution, is fully qualified to give a blood transfusion. Extreme care should of course be used in selecting the proper donor.

ALBUMINURIA AND ECLAMPSIA

The number of deaths from albuminuria and eclampsia (Table 7) is, we believe, diminishing.

Table 7. *Deaths from Albuminuria and Eclampsia, 1937.*

TYPE OF DELIVERY	NO. OF CASES
Spontaneous delivery	12
Operative delivery	8
Cesarean section	4
Unknown	5
Total	29

This is gratifying since it indicates that more women are taking advantage of prenatal care, but the number of deaths is still far too high. Many of the women in this series consulted a doctor and showed symptoms of pre-eclamptic toxemia, and were urged to return but did not do so. The committee feels that the responsibility rests with the doctor to notify the patient in writing that she should return for supervision, and to emphasize the dangers of neglecting to do so. We believe that many of these deaths could thus have been avoided. One error which was brought out in this study is that some patients with severe pre-eclamptic toxemia were followed along carefully by the medical attendant and were given efficient conservative treatment, but in spite of this the toxemia progressed in severity and labor was not induced. If a patient has a severe and steadily increasing toxemia after the period of viability, it is unwise to allow the pregnancy to continue until convulsive seizures or coma results. The mortality of eclampsia is still high; the mortality of pre-eclampsia is negligible. The uterus should therefore be emptied before convulsions develop.

ACCIDENTS OF LABOR

The 9 deaths from rupture of the uterus (Table 8) are perhaps the most needless in the entire

Table 8. *Deaths from Accidents of Labor, 1937.*

DIAGNOSIS	NO. OF CASES
Ruptured uterus	9
Spontaneous delivery	2
Inversion of uterus	2
Total	13

study. In many cases accouchement forcé was practiced. Delivery was attempted before full dilatation of the cervix, and rupture of the lower uterine segment resulted. Undoubtedly the number of deaths from this cause could be diminished by securing proper consultation by a trained obstetric specialist when complications are discovered. In 1 case rupture of the uterus resulted from a difficult version in a dry uterus with a contraction ring. This is a difficult situation, but it is usually relieved by the administration of adrenalin and deep surgical anesthesia, to relax the uterus fully before any attempt is made to turn the baby.

The 2 deaths from inversion of the uterus occurred in cases where no criticism could be made of the conduct of the third stage of labor. The placenta was probably attached under the fundus and caused a spontaneous inversion.

SURGICAL COMPLICATIONS

There were 11 deaths from surgical complications (Table 9). It is a recognized fact that ap-

Table 9. *Deaths from Surgical Complications, 1937.*

CAUSE OF DEATH	NO. OF CASES
Peritonitis, idiopathic	2
Appendicitis (all cases operated on)	6
Ruptured gall bladder	1
Volvulus, 6th month	1
Ileus after normal delivery	1
Total	11

pendicitis is a grave complication in pregnancy because the enlarged uterus prevents the omentum and coils of intestine from localizing the process, and the inflammation may spread rapidly and

cause general peritonitis unless early operation is performed. Early hospitalization is recommended when appendicitis during pregnancy is suspected.

ABORTION, NOT SEPTIC

Nine patients died following abortions that were not septic (Table 10). Six of these died of hemorrhage. Miscarriages are so common that we

Table 10. *Deaths from Abortion, Not Septic, 1937.*

CAUSE OF DEATH	NO. OF CASES
Hemorrhage	6
Drugs	1
Chemical poisoning	1
Air embolism	1
Total	9

are apt to forget that many patients die each year from hemorrhage following abortion. Some of these cases were admitted to the hospital after a great loss of blood, and evacuation of the uterus or dilatation and curettage was attempted with the patient almost exsanguinated. We believe that it is much more advisable to transfuse these patients before any operative interference is started. Some cases require considerably more than 500 cc. of blood to overcome the severe anemia present. We therefore advise not only early preparation for transfusion but the administration of 700 or 800 cc. of blood and repeated transfusions when indicated. One patient died from the use of a caustic drug in the vagina in an attempt to produce abortion. Another died from chemical poisoning from the ingestion of abortifacients. One woman succumbed from air embolism after she had inserted a syringe in the cervical canal and had forced air into the uterine cavity.

ANESTHESIA

The deaths from anesthesia (Table 11) were difficult to analyze because in many cases shock and

Table 11. *Deaths from Anesthesia, 1937.*

TYPE OF DELIVERY	NO. OF CASES
Abortion (dilatation and curettage)	1
Attempted forceps delivery and postmortem cesarean section	1
Cesarean section	3
Forceps delivery	1
Total	6

hemorrhage contributed to the fatality. It is commendable that no deaths in this series were found to have been due to the administration of analgesics during labor.

One of these patients aspirated vomitus immediately after cesarean operation and died forty-eight hours later.

It is strange that all these deaths followed the use of ether, as we believe that it is still the safest anesthetic. This raises the question as to the care the patients received during labor. Did they receive sufficient fluid? Were sweetened fruit drinks administered so that they did not develop acidosis during prolonged labor? Had they lost considerable blood so that an operative delivery was started with the patient an improper subject for anesthesia, the latter being just enough to turn the tide the wrong way?

ECTOPIC PREGNANCY

In the group of deaths from ectopic pregnancy (Table 12), 3 women who died were in a

Table 12. *Deaths from Ectopic Pregnancy, 1937.*

OPERATION	NO. OF CASES
Emergency laparotomy	3
Posterior colpotomy	1
No operation	1
Late operation for abdominal pregnancy	1
Total	6

state of collapse when first seen by a physician. One was in "severe shock," 1 in "profound shock," and the condition of 1 was described as "critical." The last-named was the only one to receive a transfusion before operation. In this type of case it is far safer to improve the general condition by transfusion and other supportive measures before opening the abdomen.

In 1 case, a posterior colpotomy was done after four days' observation. The patient was about seven weeks pregnant and complained of severe low abdominal pain and vomiting. Although bloody fluid was observed after the colpotomy, no laparotomy was performed and death resulted from sepsis three days later.

In the unoperated case the patient had had a normal period thirty-five days before the onset of spasmodic pain in the pelvic region, with some flow by vagina. The pains were thought to be menstrual cramps and morphine was administered. Fifteen hours later the pulse was very rapid, there was extreme pallor, and the abdomen was excruciatingly tender. The patient expired while being transferred to the hospital.

The last patient in this group succumbed from peritonitis after laparotomy for abdominal pregnancy. The condition had not been recognized, and the fetus had been dead for a considerable time.

Ectopic gestation is frequently difficult to diagnose, but we shall make fewer mistakes if we have it in mind every time we see a woman who complains of lower abdominal pain or irregularity of menstruation during the child-bearing period.

PERNICIOUS VOMITING

There were 4 deaths from pernicious vomiting (Table 13). Severe hyperemesis gravidarum

Table 13. *Deaths from Pernicious Vomiting, 1937.*

OPERATIVE TREATMENT	NO. OF CASES
Therapeutic abortion	2
No operation	2
Total	4

should respond to early hospitalization, intravenous glucose, sedatives and a proper handling of the neurogenic element found in most of these cases. The therapy of this condition has improved so much in recent years that interruption of pregnancy should never be necessary.

Table 14. *Deaths from Transfusion, 1937.*

TYPE OF DELIVERY	NO. OF CASES
Cesarean section	2
Therapeutic abortion (cardiac disease)	1
Total	3

TRANSFUSION

The 3 deaths from transfusion (Table 14) are very regrettable because we have emphasized so strongly the need for more transfusions, but there is unquestionably some danger in this procedure. These fatalities emphasize the necessity for very careful cross-matching of the blood; the determination of the type alone is not sufficient.

Table 15. *Deaths from Shock, 1937.*

TYPE OF DELIVERY	NO. OF CASES
Cesarean section	1
Low forceps	2
Total	3

SHOCK

It was extremely difficult to determine the number of deaths due to shock (Table 15) because this condition contributed to so many of the cases in which hemorrhage, rupture of the uterus, inversion and other conditions were present.

Table 16. *Sudden Deaths, 1937.*

TIME OF PREGNANCY	NO. OF CASES
Undelivered in 5th-6th month	1
Undelivered at term	1
Total	2

SUDDEN DEATH

Two women died suddenly, without obvious cause (Table 16). The first dropped dead when five and a half months pregnant. The other died near term. These cases are very unsatisfactory from a statistical standpoint, and it is hoped that in this type of case every effort will be made in the future to secure permission for a postmortem examination, so that the exact cause of death may be determined.

SUMMARY AND CONCLUSIONS

An analysis of all puerperal deaths occurring in Massachusetts in 1937 disclosed that many of these women received insufficient or inadequate prenatal care. The need for closer supervision during pregnancy was particularly noted in the toxemic and cardiac deaths.

Sepsis, as usual, was found to be the *bête noire* of pregnant women. A grave problem found in connection with the large number of deaths from infection is the high incidence of fatalities from attempts to induce abortion. A campaign to educate the laity concerning the danger of this procedure might prove helpful.

In the bleeding cases early hospitalization and the more frequent use of blood transfusion are urged. More autopsies should be obtained to aid in securing a correct diagnosis in obscure cases and to increase our knowledge of puerperal pathology. Medical examiners throughout the State can render valuable assistance in this matter.

This study is to continue for four more years. It is a difficult task, but it will be well worth while if in the end it results in lowering maternal mortality.

These cases constitute a group which is tremendously important from a social as well as from a medical standpoint. We bespeak the earnest co-operation of every doctor in Massachusetts in our efforts to help them.

1101 Beacon Street.

DISCUSSION

DR. RAYMOND S. TITUS, Boston: We have a great deal of food for thought in what Dr. Heffernan has told us. Let us all take it to heart.

There are one or two things that I should like to emphasize before we go on to the next paper. One of these is the importance of having death certificates show the correct cause of death. It is impossible to derive correct vital statistics from inaccurate reports. If, for example, a number of deaths are put down as due to emboli when in reality they were caused by ruptured uteri, we decide that just so many cases have been lost from emboli, whereas that is not the case. Let us try to note on our death certificates the true cause of death. If a woman had sepsis, let us say she died of sepsis, not that she died of acute myocarditis.

One word about autopsies. There were 67 or 68 of these 318 cases that were autopsied. Let us bring influence to bear in our communities to get the medical examiners sufficiently interested to do autopsies on cases which are of vital interest. One case, for instance, I should like to

call to your attention. The patient had a miscarriage and was sent to the hospital. She was transfused shortly afterward, not because she really needed the transfusion but because it was thought she would be much better off if she had some blood. There was no immediate reaction. Twelve hours after the operation oozing began from one wound on the arm. By the time the doctor arrived to remove the dressing, thinking that there was a leaking vessel which he might tie, there was oozing from the other arm, into which fluid had been injected. It was impossible to stop the oozing from these two wounds. Before the patient died, which she did in two or three hours, there was oozing from the nose and mouth and the mucous membranes throughout the body. The death certificate gave the cause of death as embolus, which was absolutely false.

DR. SAMUEL A. COSGROVE, Jersey City, New Jersey: The diminution of obstetric mortality which Dr. Heffernan showed in his first slide has been paralleled wherever such a study as this has been attempted and carried out. It is abundant proof of the value of the program which the section has been undertaking. Dr. Heffernan has set up what I believe to be the best plan of carrying out such an investigation; that is, in providing for direct personal contact between representatives of his committee, the hospitals where deaths have occurred, and particularly the attendants on those deaths. His comments have been so keen and have, to me, expressed such a completely satisfactory standard of obstetric practice and obstetric opinion that I hesitate to comment except in a very few matters, and shall point out only what seem to me the significant aspects of his conclusions.

In the first place, one quarter of the septic deaths shown in this survey were due to cesarean section. Inasmuch as the incidence of cesarean section is only about 4 per cent throughout the State, this means that patients so delivered incur about six times the risk of sepsis that other patients do. He spoke of much of the unnecessary maternal mortality as dependent on lack of co-operation, understanding and intelligence on the part of the public and our own patients. I do not want to weaken at all the emphasis which he has placed on the responsibility of the physician, primarily, for unnecessary maternal mortality. But I do think that the public should be made to understand that the whole cause of inadequate results does not depend on the physician, but is importantly contributed to by them. Laymen, as well as physicians, have a responsibility in educating that portion of the population which is suffering from the result of lack of intelligence.

CESAREAN SECTION IN MASSACHUSETTS IN 1937*

ROBERT L. DENORMANDIE, M.D.†

BOSTON

AT a conference held last winter by the officers of this section with the physicians studying the maternal deaths throughout the State, the program for this meeting was discussed. One suggestion was that the incidence of cesarean section in Massachusetts be studied. As none of the physicians present had any idea of the number of cesareans being done or the results being obtained, it was agreed that such a study should, if possible, be made and reported on at the section meeting.

We appealed to the Massachusetts Department of Public Health in order to see whether funds to make such a study were available under the Social Security Act. Finding that this was the case, we asked the Commissioner of Public Welfare whether a simple questionnaire could be sent to all the licensed lying-in hospitals, in order to learn the incidence of cesarean section in the year 1937 and the results. He was most co-operative, and signed the covering letter for the questionnaire. The Department of Public Health had the mailing done for us. Had it not been for the co-operation of these two departments, this investigation could not have been successful. To them we owe our sincere thanks.

The questionnaire asked for a report on all the cesareans and hysterotomies done in 1937, whether they were emergency or elective, the indications for operation, whether a consultation was held with a surgeon or an obstetrician, the type of operation performed, whether the patient was in labor, whether the membranes were ruptured, the type of anesthesia used, the patient's convalescence, the condition of the mother and the baby on discharge and whether an autopsy was held, if death had occurred.

The questionnaire was sent to one hundred and seventy-one licensed maternity hospitals. No questionnaire was sent to ten hospitals, for they were known by the Department of Public Welfare not to be equipped to do cesareans. Thirty-seven of the hospitals had no cesareans during 1937; they were all small hospitals except one, but in that hospital there were 209 deliveries. One hundred and thirty-three other hospitals answered the questionnaire. Only one hospital failed to reply, and that was a small, unapproved one.

The first cesarean at the Boston Lying-in Hospital was done on July 15, 1894. The one-hundredth section was done on June 29, 1907. Thirteen years

*Presented, in part, at the annual meeting of the Massachusetts Medical Society, Boston, May 31, 1938. The original report was based on 1706 questionnaires that had then been returned; this paper is the final report.

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were required for a series of 100 cases. At that time practically the only indications for a cesarean were contracted pelvis and a previous section. Gradually, as improvement in technic has taken place, the indications for cesarean section, as we all know, have been widened until now the one and only indication necessary in the minds of some physicians is pregnancy.

Table 1. *Summary of Abdominal Deliveries.*

OPERATION		NO. OF CASES
Cesarean Section		2082
Emergency	872	
Elective	1178	
Not reported	32	
Type of operation:		
Low	1112	
Classical	870	
Latzko	19	
Porro	21	
Peritoneal exclusion	1	
Not reported	59	
In labor	681	
Not in labor	1333	
Not reported	68	
Membranes ruptured	296	
Membranes unruptured	1697	
Not reported	89	
Hysterotomy		24
Total		2106

In Massachusetts in 1937 there were 62,228 live births and 1760 stillbirths, a total of 63,988 births. Of these, 48,966 took place in hospitals. From the answers to the questionnaires we found that there were 2082 cesareans and 24 hysterotomies, a total of 2106 abdominal deliveries, or an incidence of 1 in 30.3 births.

There were 1178 elective and 872 emergency cesarean sections (Table 1). This division may not be absolutely correct, for in many cases the sections were designated as elective when the patient had had many hours of labor and in some cases of bleeding. The surgeon elected to operate, but it became an emergency operation. An elective cesarean is planned ahead of time and the patient is not in labor. As to the type of operation, there were 1112 low sections, 870 classicals, 19 Latzkos, 21 Porros and 1 peritoneal exclusion. In 59 cases the type of operation was not reported. Thirteen hundred and thirty-three patients were not in labor, 681 were in labor. Sixteen hundred and ninety-seven cesareans were done with membranes unruptured, 296 with membranes ruptured. The chart shows the number not reported in each division.

Table 2. *Indications for Hysterotomy.*

INDICATION	NO. OF CASES
Essential hypertension	2
Cardiac disease	8
Pre-eclampsia; previous nephrectomy	1
Increasing toxemia	1
Nephrolithiasis	1
Hypertension; chronic kidney disease	2
Hydatid mole	2
Psychosis	1
Tuberculosis	1
Placenta previa (3½ mo.)	1
Acute polyhydramnios	1
Error in diagnosis	2
Not reported	1
Total	24

Table 3. *Types of Anesthesia.*

ANESTHETIC	NO. OF CASES
Nitrous oxide, oxygen and ether	1357
Ether	353
Cyclopropane	103
Spinal	90
Nitrous oxide and oxygen	81
Avertin, and nitrous oxide, oxygen and ether	50
Local	37
Evipal	7
Ethylene	5
Paraldehyde and nitrous oxide and oxygen	3
Ethyl chloride and ether	3
Vinethene and ether	1
Nembutal and paraldehyde	1
Chloroform and ether	1
Not reported	14
Total	2106

The indications for the 24 hysterotomies (Table 2) are clear with the exception of 2 cases classified as "error in diagnosis." These are interesting. In both cases the diagnosis of abdominal tumor was made, the abdomen was opened and a pregnant uterus was found. In 1 case the patient presented a uterus enlarged to the size of a four-months' pregnancy, a needle was inserted, clear fluid was obtained, and a hysterotomy was done.

Table 4. *Indications for Operation in Cases with Death of the Baby.*

INDICATION FOR OPERATION	NO. OF CASES
Placenta previa (1 monster)	45
Premature separation of placenta	43
Toxemia (2 macerated fetuses)	23
Eclampsia	2
Previous section (1 monster; 1 macerated fetus)	22
Elective section (7 monsters; 5 cases of bronchopneumonia; 1 set of twins; 1 macerated fetus)	26
Dystocia (3 monsters; 2 macerated fetuses)	17
Cardiac disease	5
Prolapsed cord	2
Uterine inertia (1 macerated fetus)	2
Diabetes	2
Pyelitis	1
Carcinoma of cervix	1
Not reported	1
Total	192

In the other case a hysterotomy was done at once. In both these cases the Aschheim-Zondek test was negative, but why a hysterotomy was done when a normal pregnant uterus was found it is hard to understand.

Comment should be made on 2 other cases. It is difficult to understand why an abdominal delivery should be done on a so-called placenta previa at three and a half months, or on an acute hydramnios at six months.

Table 3 shows the kinds of anesthetic used in all operations. As was to be expected, the combination of nitrous oxide, oxygen and ether was by far the commonest. Only 2 deaths could be ascribed in any way to the anesthesia, and those will be taken up later.

There were 18 sets of twins. Twenty-four of these babies left the hospital alive and 12 were born dead or died there. There was 1 set of Siamese twins.

Table 4 lists the reasons for operation in 192 cases in which the babies died. Cesareans were done in 7 cases where the babies were dead and macerated. In one hospital 5 babies died of bronchopneumonia. Twelve had major malformations, and in 3 of these cases, hydrocephalus was diagnosed by x-ray before operation. Of the cases in which babies died, 26 mothers had elective sections. Of these babies, there were 7 monstrosities and 1 macerated fetus. In all elective sections, an x-ray should be taken before operation. That 3 cesareans were done on patients having known hydrocephalic babies is a serious criticism.

As to the convalescence of these cases, in the large majority of questionnaires it was reported as uneventful. But notes made on many showed that phlebitis had developed. Other patients had marked abdominal distention for days, and temperatures persisted for much of the convalescent period. Several patients had pulmonary emboli but recovered. A great many cases showed a moist or suppurating abdominal wound. Several patients developed upper respiratory infections. Others had acute retention of urine and had to be catheterized, or an inlying catheter was used. One developed intestinal obstruction, but operation was not necessary. It is fair to say, therefore, that although all but 66 women recovered, many had stormy, uncomfortable convalescences.

As to the indications for cesareans (Table 5), there can be no quarrel with the indication of previous sections (576 cases). There is no way of determining whether all the 539 cases classified under contracted pelvis had so severe a contraction as to indicate a section. So many of these were done by general surgeons that one cannot help questioning the necessity of operating in many cases. Placenta previa was an indication in 183 cases. There is no question that in many of these the indication was valid. But in others the operation was done when the patient was only six or seven months pregnant. These cases could in all probability have been handled as well or better by vaginal operation, and in future pregnancies the excuse of doing a section because of a previous one would not be present.

It is interesting that only 10 sections were done for eclampsia. The enthusiasm for sectioning every eclamptic patient is fortunately past.

Undoubtedly the indication was real in some of the 72 cases of dystocia. But again and again the report shows that patients were in labor six, eight or ten hours, with or without some dilatation of the cervix, and a cesarean was then done. Surely many of these operations were totally unnecessary.

In the next two groups, elderly primiparae and obstructing tumors, there can be no real criticism. If a woman has been married many years, and is thirty-five or forty years old, with a high presenting part, it is surely justifiable in many cases to do a cesarean. But to do one because the patient happens to be thirty-five or forty is not justifiable without some other indication.

How real was the indication of fetal distress is questionable, for when the operation was done for this indication only 2 babies were lost.

Table 5. *Indications for Cesarean Section.*

INDICATION		NO. OF CASES
Previous section		576
Contracted pelvis		539
Placenta previa		183
Separated placenta		77
Toxemia		123
Eclampsia		10
Malposition of baby		68
Breech	46	
Transverse	16	
Brow	3	
Elbow	1	
Chin	1	
Face	1	
Cardiac disease		46
Previous obstetric disaster		57
Uterine inertia		22
Dystocia		72
Labor without progress	42	
Contraction ring	3	
Cervical dystocia	24	
Persistent ODP position	2	
Contracted uterus	1	
Elderly primipara		48
Obstructing tumor		15
Previous repair		40
Amputation of cervix	13	
Perineal repair	27	
Fetal distress		14
Prolapsed cord	9	
By request or for sterilization		27
Previous suspension of uterus		3
Previous operative delivery		7
Unengaged head		5
Following operative attempts at delivery		3
Pyelitis		4
Rupture of scar of previous section		1
Twins		2
Prolapse of uterus		2
Contraction of vagina		1
Tuberculosis		4
Diabetes		2
Pernicious anemia		1
Carcinoma of cervix		1
Subacute appendicitis		1
Ruptured uterus		1
Varicosities of vulva		1
Double uterus		2
Complete tear		1
Previous hysterotomy		1
Feeble-mindedness		1
Hydrocephalus		4
Premature labor		3
Multiparity		2
Post-maturity		8
Error in diagnosis		2
Not reported		47
Bizarre		55
Total		2082

To do a cesarean simply on the request or insistence of the patient, or for sterilization alone, is to say the least a questionable procedure, and yet this was done in 27 cases.

In the 5 cesareans noted as done for unengaged head, the mother had had practically no labor. In the 3 done following operative attempts at delivery all the patients recovered, but the risk to which they were subjected was of course great.

Rupture of the scar of a previous section was the indication in 1 case, but in 2 other cases the scar was found ruptured at operation. In the case of ruptured uterus, the diagnosis was made on entrance to the hospital and the patient was operated on at once. The cause of this rupture was not reported.

Three indications — previous hysterotomy, feeblemindedness and hydrocephalus — I cannot agree are reasonable, and surely the next two are not — premature labor and multiparity. There were 6 cases noted as post-mature, the patients being one to two weeks over their expected dates.

Two cases are listed as due to an error in diagnosis. In the first case the patient was supposed to have had a separated placenta, but when operated on was found to have a normal pregnancy. The second was a forty-three-year-old multipara, and it is stated that two x-rays showed no evidence of pregnancy. No fetal heart was heard and no small parts were mapped out. The preoperative diagnosis was ovarian cyst or fibroid. When the abdomen was opened a pregnant uterus was found and a live baby was delivered.

The last heading is "bizarre." Some, I suppose, would call it "miscellaneous." There are 55 cases under this classification. I cannot discuss them all, but to me the reasons given on the questionnaires are pitiable: "Danger to the baby if forceps applied"; "Face to pubes by x-ray"; "Inability to deliver the baby normally"; "In labor three days and no cervical dilatation." The indication "cervical dystocia" at once brings up the question of diagnosis. Was it not false labor? Cervical dystocia combined with contracted pelvis was one of the most frequent indications given. I grant that the lack of progress in cervical dilatation in the presence of apparently good uterine contractions is a difficult problem to manage. But I am sure that had many of these cases been treated conservatively the results would have been better. Cervical dystocia does occur, but I do not believe to any such extent as these cases would lead one to think.

To continue the indications: "X-ray showed the head and pelvic measurements about the same"; "Intrauterine decapitation"; "Owing to an accident, patient unable to stand labor"; "Cord twice about the neck"; "Danger of recurrence of inversion of the uterus"; "Postoperative adhesions"; "Previous placenta previa and chronic gastric ulcer"; "Secondary anemia and bronchitis." In the last-named case the anesthetic used was nitrous oxide, oxygen and ether. "Fatigue and cervical dystocia"; "A tight perineum"; "Extreme abdominal distention and discomfort"; "Age of patient thirty-one, membranes ruptured six hours and no labor"; "Temperature and pulse rising, meconium being passed, and a rapid fetal heart"; "Social and economic reasons." The last was one of the reasons given for sterilization. "Premature rupture of the membranes"; "Inability to induce labor by medical means"; "Previous surgery"; "Hydramnios, abnormal fetus." I think you will agree with me that these are bizarre. There can be no justification for the large majority of the sections done under this heading.

Table 6. *Indications for Operation in Cases with Maternal Death.*

INDICATION	NO. OF CASES
Lack of progress	21
Placenta previa	7
Toxemia	6
Previous section	7
Separated placenta	8
Cardiac disease	5
Elderly primipara	3
Eclampsia	1
Prolapsed cord	1
Previous disaster	1
Bandl's ring	1
Hard previous delivery	1
Fetal distress	1
Request of patient	1
Breech	1
Not reported	1
Total	66

Table 7. *Summary of 66 Cases with Maternal Death.*

	NO. OF CASES
Emergency	51
Elective	15
Not reported	0
Type of operation:	
Low	29
Classical	29
Latzko	1
Porro	2
Peritoneal exclusion	1
Not reported	4
In labor	31
Not in labor	32
Not reported	3
Membranes ruptured	13
Membranes unruptured	47
Not reported	6
Babies:	
Living	43
Dead	23

There were in this series, as I have said, 2106 abdominal deliveries with 66 maternal deaths. This gives a maternal mortality rate of 3.1 per cent, and we must confess that it is a remarkably good record. The indications for operation in these 66 fatal cases are shown in Table 6.

Table 7 shows that 51 of these 66 deaths followed an emergency operation, while 15 followed an elective one. Undoubtedly had these patients all had efficient prenatal care the number of emergency operations would have been materially lessened, with a corresponding lowering of the number of deaths. The low and classical types of section had the same number of deaths, each 29. Since there were 1112 cases of the former and 870 of the latter, the mortality rate for low section is somewhat less than that for the classical operation, but from these figures it can scarcely be argued that the low section is a much safer procedure. The Latzko, Porro and peritoneal exclusion operations prove conclusively what type of case the operator was dealing with. Forty-three babies of these dead mothers lived and 23 were lost. One was macerated, with a bad malformation.

Table 8. *Causes of Maternal Death.*

CAUSE OF DEATH	NO. OF CASES
Sepsis	28
Cardiac disease	7
Embolus	7
Hemorrhage	5
Shock	6
Anaphylaxis	2
Toxemia	3
Chronic nephritis	1
Toxic purpura hemorrhagica	1
Acute tracheobronchitis	1
Bronchopneumonia	1
Thyrotoxicosis	1
Inhalation of vomitus	1
Anesthesia	1
Not reported	1
Total	66

Table 8 shows the causes of the maternal deaths. Twenty-eight (42 per cent) were due to sepsis. The cardiac patients were in all probability extremely sick women and the operation was done as the best way out of a serious dilemma. Embolism accounted for 7 deaths, and this we must face as a possibility in any abdominal operation. Hemorrhage and shock are closely connected; they accounted for 11 deaths. That 2 deaths should have followed improper matching of blood for transfusion is to be noted, and both deaths must be considered preventable. The 3 deaths from toxemia were of women who had had little or no prenatal care and had been allowed to remain in labor for many hours. It is very doubtful whether they should have been operated on. The case assigned to toxic purpura hemorrhagica was one of toxic separation of the placenta. The patient bled wherever a stitch was taken, and after the wound was sewed up it continually oozed. There was also oozing through the gums. The case of acute tracheobronchitis occurred in a woman thirty-eight years of age, married for many years, with a high presenting part, on whom an elective classical section was done. The cause of death was determined only at autopsy; the abdominal incision and the peritoneum were absolutely clean. Bronchopneumonia was the cause of 1 death. The death following inhalation of vomitus of course must be put down as preventable. The death assigned to anesthesia was that of a woman who died suddenly with an acute pulmonary edema at the end of the operation. There was no autopsy and the medical examiner gave the cause of death as anesthesia. In the death assigned to thyrotoxicosis the medical consultant who was called could find nothing on examination but a very rapid pulse. There was no evidence of sepsis. No autopsy was obtained, and the consultant thought that the death was due to a previous thyroid condition which had not been discovered.

How many of these deaths should be classified as preventable it is, on the information obtained from the questionnaires, impossible to state. But the question arises, Was there a real indication for operating? The answer must be, "No." Theoretically, sepsis is preventable, but as a matter of fact none of us can prevent it at all times. Careful, continuous prenatal care will reduce the incidence of emergency cesareans, and it should therefore follow that fewer deaths from sepsis would occur.

There were 39 autopsies done: 14 on mothers and 25 on babies. This gives a rate of only 12 per cent. The importance of all physicians' trying to obtain permission for an autopsy cannot be too strongly stressed. Had the autopsy on the case of acute tracheobronchitis, which I have already mentioned, not been obtained, the death would unquestionably have been assigned to sepsis. Very possibly other diagnoses in this classification would be different had there been autopsies. We all realize that sepsis is the commonest cause of death in cesareans, even though the death is at times put down as toxic myocarditis.

Eighty-seven of the hospitals to which questionnaires were sent are approved by the American College of Surgeons, and four are provisionally approved. In the college's standards for hospitals taking obstetric patients is the following requirement: "Frequent consultations should be encouraged on the obstetric service, and a consultation made obligatory in all cases where major operative procedures may be indicated." In our questionnaire we tried to find out whether a consultation had been held or not, but the answers were so vague and confused that nothing could be made of them. It was, however, clearly shown that 788 of these cesareans were done by surgeons. The object, I take it, of having a consultation in

obstetric cases is to stop ill-advised operative procedures. A consultation does not mean a request for the surgeon to do the operation. I have no objection to a well-trained surgeon's doing a cesarean, but I do object to a physician with no experience in operative obstetrics, who calls on a surgeon to get him out of his difficulties. In such a case the only procedure the surgeon knows how to do is a cesarean, and he is usually only too glad to do it.

I am confident that if the American College of Surgeons withheld its approval from hospitals where no obstetric consultations are held, the number of cesareans would be materially diminished, for not one of the hospitals that are now approved by the college would wish to lose its approval.

Table 9. *Statistics on Cesarean Sections Performed in 1937 in Various Hospitals in Massachusetts.*

Hospital	Location	Total Births	Cesarean Sections No.	Cesarean Sections Incidence
Acushnet	Acushnet	105	17	1:6.1
Boston City	Boston	3095	80	1:38.5
New England Hospital for Women and Children	Boston	1498	106	1:14.1
Massachusetts Memorial	Boston	1027	111	1:9.2
Boston Lying-in	Boston	4274	119	1:35.9
Evangeline Booth	Boston	505	13	1:38.8
Forest Hills	Boston	470	32	1:14.6
Goddard	Brockton	381	8	1:47.7
Brockton	Brockton	395	12	1:32.9
Cambridge	Cambridge	926	57	1:16.2
Cambridge City	Cambridge	693	17	1:40.7
Charlesgate	Cambridge	117	21	1:5.5
Chelsea	Chelsea	344	29	1:11.8
Clinton	Clinton	209	0	0
Whidden Memorial	Everett	505	33	1:15.3
Union	Fall River	468	48	1:11.4
Burbank	Fitchburg	584	27	1:21.6
Union	Framingham	410	16	1:25.6
Haverhill Municipal	Haverhill	391	42	1:9.3
Holyoke City	Holyoke	289	2	1:144.5
Sisters of Providence	Holyoke	597	8	1:74.6
Cape Cod	Hyannis	274	38	1:7.2
Lawrence General	Lawrence	379	11	1:34.4
Lowell General	Lowell	334	8	1:41.7
St. Joseph's	Lowell	374	8	1:46.7
Union	Lynn	457	22	1:20.7
Lynn	Lynn	337	26	1:12.9
Malden	Malden	667	32	1:20.8
Melrose	Melrose	433	26	1:16.6
Milford	Milford	342	7	1:48.8
Natick	Natick	228	23	1:9.9
St. Luke's	New Bedford	714	48	1:14.6
Union	New Bedford	54	14	1:3.8
Newton	Newton	652	35	1:18.6
Cooley Dickinson	Northampton	357	8	1:44.6
House of Mercy	Pittsfield	413	24	1:17.2
St. Luke's	Pittsfield	421	16	1:26.3
Quincy City	Quincy	918	28	1:32.7
Salem	Salem	531	51	1:10.4
Mercy	Springfield	991	13	1:76.2
Wesson Memorial	Springfield	1366	45	1:30.3
Waltham	Waltham	531	10	1:53.1
Weymouth	Weymouth	530	44	1:12
Worcester City	Worcester	1037	15	1:69.1
Worcester Memorial	Worcester	676	55	1:12.2

I happen to be one of the obstetricians who still believe that most women can have their babies from below without undue risk, and I cannot help thinking that many of these cesareans were entirely unnecessary.

Some years ago, before the American College of Surgeons was active, in one operating room in Massachusetts was posted a sign directing that no cesarean was to be done without previous consultation with two members of the staff. That was a most salutary rule, and I think the reason for it was that at that hospital three cesarean patients in succession had been lost from sepsis, although the death certificates gave "ileus," "paralytic ileus" and "vasomotor paralysis" as the cause. It is interesting to note that in 1937, while this same hospital had 367 births, it had only 5 cesareans.

Table 9 shows the incidences in various hospitals. All but 6 in this list are approved by the American College of Surgeons. I have not included all the one hundred and thirty-three hospitals, but have taken a fair cross-section of the entire state. I call your attention to the wide variation, not only in similar communities but in the same community in different hospitals. Some hospitals have a large emergency service, and that of course will raise the incidence, but I believe it will not account for all the difference. I have already spoken of many cases in which the cesarean operation was not justified. The wish of the doctors in charge must be responsible to some extent for this variation. Many have poor obstetric judgment and little conscience. Cesarean section is in some doctors' minds, as has been justly said, merely "an alternate method to a normal delivery."

Cesarean section is, as we all know, one of the greatest blessings of modern obstetrics. Its abuse is the thing to which we obstetricians object. Any woman on whom a section is done faces the possibility of sepsis or embolus. True, she does that when she has a baby by vagina, but the risk is distinctly less. When a second section is performed she faces these two risks, and the added one of a possible rupture of the scar and adhesions in the abdomen which may give rise to serious complications.

It is my firm belief that were the standards of the American College of Surgeons insisted upon in every hospital, the incidence of cesareans would at once drop. I do not believe that any of you had the slightest idea that the number of cesareans performed here in Massachusetts was as great as it is. I am convinced from going over the reports that a large number of those performed were unnecessary; exactly how many, it is impossible to say. I am of course delighted that the mortality rate was so low, but we must remember that many of these women alive today may be dead as a result of another cesarean before a further report is made to you. The object of this study is to determine in what way the maternal mortality in Massachusetts can be bettered. One means, I am sure, is to reduce the number of unwarranted cesarean sections.

Discussion

Dr. Raymond S. Titus, Boston: Dr. DeNormandie's paper will, I am sure, give you food for more thought. Hospitals are the natural evolution of the way we practice medicine. They are not asylums for our patients. They are not founded for the purpose of making it simpler for us to practice our vocation. They are supported because the medical profession has at last convinced the public that patients are better taken care of in hospitals than they are at home.

If that premise is true, hospitals have a grave responsibility, as has the medical profession. If hospitals do not see to it that the patients whom they welcome at their doors are given the best obstetrics available, they are falling down on their duty to the populace. If we as physicians do not see to it that the men on the staffs of our hospitals are doing the best obstetrics that can be done, we are not doing our duty.

The trustees of hospitals, of course, are the responsible persons. One hospital near Boston has taken the initiative. The trustees have asked for a voluntary board of consultants to advise them how to run their various departments; one reason for this decision is the fact that obstetrics in that hospital is poorly done. Another hospital, not far from Boston, has already defined the type of work that each man on the obstetric staff is allowed to do.

Now, the fact that a certain group of men have received an equal amount of training is no reason to assume that they are equally trained as obstetricians. Obstetricians should do and must do the bulk of obstetrics in Massachusetts, if we are going to lower the number of cesarean sections.

Dr. Samuel A. Cosgrove, Jersey City, New Jersey: Dr. DeNormandie's paper is painstaking and arresting, and his conclusions are presented with much restraint and tolerance.

Inasmuch as cesarean section is a hysterotomy, Dr. DeNormandie's distinction between the two is not particularly clear; I take it that by the term "hysterotomy" he means that performed early in pregnancy for the purpose of terminating it.

Perhaps the one fact of outstanding significance in Dr. DeNormandie's analysis is the preponderant number of so-called elective sections. In my own opinion and in the experience of our clinic, elective cesarean section as defined by Dr. DeNormandie — one "planned ahead of time and [with] the patient . . . not in labor" — should be and is one of the rarest procedures. Indeed, some of the members of my staff contend that we virtually never do an elective section as thus defined. It should be restricted almost entirely to the very rare absolute indication of the obstetricians of former generation, namely pelvic contracture of such degree as to be characterized by a true conjugate of 6 cm. or less. Except for such absolute indication, and an occasional elective section in the presence of progressive toxemia, our sections fall into three groups: those done for obstetric accident, as placenta previa, abruption of the placenta and rupture of the uterus; cases of mechanical difficulty dependent on relative cephalopelvic disproportion; and cases of relative disproportion modified by other factors such as age, an unfavorable obstetric history, previous cesarean section, malpresentation and the like.

The first group is necessarily emergent and therefore in no sense elective. The second and third groups are almost invariably susceptible to a more or less extended test of labor. To assert dogmatically, on the basis of any estimation which we can make prior to the onset of labor in regard to pelvic size, configuration and relative fetal proportion, that a certain case can or cannot deliver from below, is to arrogate to ourselves a competence in prognosis which I do not believe we possess.

The number of cases in which experience embodied in the test of labor confounds confident prior prognosis is large. Therefore, almost universally we subject such patients to a test of labor, longer or shorter dependent on all the circumstances of each case. Such a course does not jeopardize the result of eventual recourse to section, particularly if employment of extraperitoneal section is within the capacity of the operator. I feel sure that had all the 971 cases listed as "elective" in these statistics received the benefit of a carefully watched test of labor, the necessity for section would have been materially reduced. This would naturally have contributed to the elimination of unnecessary cesarean section as a whole, and thereby have enhanced maternal safety.

Time does not permit a discussion of all the many interesting points which Dr. DeNormandie has made. I shall therefore proceed at once to a discussion of indications. In fairness to the operators in all these cases, it must be realized that the results of a survey based on questionnaires are not adequate for valid interpretation of indications. In any given case the indication depends on a judgmatic balance of many factors for and against such interference, as well as the balance of possible jeopardies for both the mother and the baby. It is often quite impossible to reduce this calculation to a single word which will justify the operation as a matter of record. In any series of cases, the only really competent means of conclusion as to the justification for operation is the extremely laborious one of detailed inspection of the entire record by the commentator, and his assessment of the validity of indication on all the evidence presented. It is obvious that questionnaires cannot reflect this evidence.

But Dr. DeNormandie is justified, even with the inadequate tools at his command, in making certain strictures, and I am somewhat inclined even to extend them. For instance, he accepts previous section unqualifiedly as a valid indication, and this accounts for about 28 per cent of the whole series. I do not believe that previous section, per se, *is* a valid indication for another section. As already indicated, it should be judged in relation to other existing indications. In a competently staffed clinic where strict observation of the patient can be maintained and full preparation made for the prompt handling of any emergency, a woman need not be doomed to section after section merely because she has had one or more sections previously. There now is in one of the wards of my service a woman who had a section without trial of labor for an assumed pelvic constricture; at her last delivery she was again sectioned merely because she had had the first section; her third delivery in our hands was a perfectly spontaneous vaginal one of a good-sized, healthy baby. Another patient, who had had two previous sections for supposed disproportion, actually precipitated while preparation was being made for a third. A third patient, a multigravida who with her fifth or sixth pregnancy had a forced section for complete abruption of the placenta in our clinic some seven or eight years ago, has since that time had three spontaneous deliveries without complications. Cases of this sort may be endlessly multiplied.

While I am by no means ignorant of the significance of prior section and have indeed seen, as have you all, rupture of the uterus occur under such circumstances, I am definitely opposed to the acceptance of previous section as an invariable indication for successive sections.

With all Dr. DeNormandie's comments on other phases I am in hearty accord. Particularly do I want to emphasize his remark that cervical dystocia does occur, but

not to the extent indicated by these cases. I should even go further, and state my own conviction that except in rare cases of actual disease or cicatrization of the cervix, there is no such thing as cervical dystocia, but that apparent cervical dystocia depends on cephalopelvic disproportion.

The maternal mortality of 3.1 per cent is indeed good for such a broad series as Dr. DeNormandie is quoting, but inasmuch as this is about ten times the maternal mortality of all patients in an adequately cared-for community, it emphasizes Dr. DeNormandie's contention that cesarean section carries a much greater hazard than vaginal delivery and should be restricted to undoubtedly valid indications. It is hard to see, however, why almost one fourth of the maternal deaths should be incident to elective section if the operations were actually elective. Under Dr. DeNormandie's definition such operations should be almost devoid of mortality.

I am glad that Dr. DeNormandie has pointed out that these statistics show that low section is not an outstandingly safer procedure than classical section. This does not mean that I myself do not prefer the lower operation and have not for many years done a classical section. I believe that in the same hands the lower operation is very much preferable to the classical, not only in lessening maternal mortality, but very significantly in lessening morbidity. But I am glad to lay emphasis on the fact here shown that the lower operation cannot be too greatly depended on to succeed under circumstances in which the classical section would be dangerous. In other words, I am inclined to insist on the same contraindications for *any* type of peritoneal section, whether it be of the high or the low variety.

Sepsis, I think, in all experience remains the highest cause of death following cesarean section. As Dr. DeNormandie points out, this fact is a continued indictment of our judgment in the type of cases which we commit to cesarean section, and perhaps in a lesser degree of our technical efficiency.

I most heartily endorse what Dr. DeNormandie has said as to surgical consultation in relation to cesarean section, and join with him in his confession of faith that via the natural birth tract is the safest way for most women to have their babies.

The discussion of rates of incidence of cesarean section is a difficult one. It is undoubtedly true that the rate in some hospitals, as Dr. DeNormandie says, is too high, and if he is correct in all the implications of his argument, as I believe he is, such excessive incidence means primarily unnecessary maternal mortality. On the other hand, I do not believe that it justifies the election of type of delivery with primary reference to incidence rates. It is easily conceivable that the attempt to keep rates low as a primary objective will mean a needless sacrifice of babies and an unnecessary incidence of irreparable invalidism to mothers.

In any service, therefore, or in any individual practice, I believe the ideal to be most closely attained by the following:

Careful preliminary estimate of the potentialities of each case.

The test of this estimate almost invariably by the patient's actual experience in labor.

Final checking on conclusions, based on the preliminary estimate and the test of labor, by consultation, where possible, with trained obstetricians.

It does not seem possible that in a commonwealth like your own there are not sufficient obstetricians scattered widely enough to make it possible for any practitioner in obstetric difficulty to obtain the services of a properly qualified obstetric consultant within a reasonably short period of time, except in the most urgent emergencies. If this is so, then the choice of surgeons as consultants in lieu of obstetricians is indefensible. If it is not true, I think that your state society should find means of making available to practitioners in any locality a flying corps, so to speak, of consultants; this would make available to every pregnant woman the services of a competent obstetrician in consultation with her physician.

Finally, the selection of the method of delivery within optimum time limits in relation to the events of labor progress, and in consideration of the best relative interest of mother and fetus, but without every regard to the influence of this decision on mere statistics of incidence.

I believe Dr. DeNormandie has thoroughly, judiciously and tolerantly accomplished a most laborious task.

THE SMALL OBSTETRIC HOSPITALS IN MASSACHUSETTS*

A Preliminary Report

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THE Executive Committee of the Section on Obstetrics and Gynecology has delegated two of its members to make a preliminary report on obstetrics in the smaller hospitals of the State. This report, which is in a way complementary to the other papers presented at this meeting, is, owing to limitations in time and facilities for investigation, admittedly incomplete, and deals with the subject only superficially.

In this report we shall include the method of licensing hospitals; their type and size; their activities as regard numbers of patients delivered; their general organization with limitations, if any, imposed on their staffs; their facilities for handling major obstetric surgery.

There are in Massachusetts one hundred and seventy-three hospitals having lying-in licenses. These vary in the number of beds assigned to obstetrics, from 1 to 225. In estimating what would constitute a small hospital from an obstetric point of view, the committee has arbitrarily taken hospitals with 25 obstetric beds and under as representing smaller hospitals. There are 126 of these, and to them questionnaires were sent covering the activities above-mentioned.

Method of Licensing Hospitals. In considering the formation of lying-in hospitals, we find that the licensing power comes in Chapter 111, Sections 71 to 75, of the laws relating to public health. Sections 71 and 72, which deal with licensing and inspection, read as follows:

> SECTION 71. The department of public welfare may issue a license, subject to revocation by it, to any person whom it deems suitable and responsible to establish or keep for two years a maternity hospital, hospital ward or other place for the reception, care and treatment of women during pregnancy, delivery or while recovering from delivery, if the local board of health shall first certify to said department that, from its inspection and examination of such hospital, hospital ward or other place aforesaid, the same is suitable therefor.
>
> SECTION 72. The department of public welfare shall have supervision of all such hospitals, hospital wards or other places, may make necessary rules for their regulation, and may visit and inspect the same. The said hospitals, hospital wards and other places shall also be subject to visitation and inspection at any time by the head of the police department, or his authorized agent, or the board of health of a city, or by the chief of police, selectmen or the board of health of a town, and, if during the year it receives more than six patients, by the department of public health.

Sections 73, 74 and 75 have to do with penalties and with the establishment and maintenance of free beds and are irrelevant to the starting of a hospital.

Type and Size. The total number of obstetric beds in the entire list of one hundred and seventy-three hospitals is 3568. The one hundred and twenty-six smaller hospitals contribute to this number 1417, or approximately 40 per cent. These hospitals we have divided with regard to whether or not they belong in Class A, according to the standards of the American College of Surgeons; forty-four hospitals with a total of 773 beds are so classified. The remaining eighty-two may be subdivided into those of more than 5 beds, of which there are fifty-nine, and those of less than 5 beds, of which there are twenty-three. The hospitals having from 5 to 25 beds have a total of 582 beds, and the smaller group only 62 beds. Excluding this latter group, which is for the most part made up of small, privately owned hospitals, we find the average number of beds in non-Class A hospitals to be 10, and in the Class A hospitals 17. Size, however, is not essential to being in Class A, since there is one such hospital with only 2 obstetric beds and several with less than 10.

Activities. In ascertaining the activities of the Class A and non-class A groups, we received answers from all 44 hospitals in the former group and from 68 of the 82 in the latter. We found that the former during the year 1937 delivered 10,600 cases, or 214 per hospital, and the latter group 5179, or 75 per hospital. Considering the relative average number of beds, this shows a definitely slower turnover in the non-Class A group. Such a turnover indicates a preference on the part of both the profession and the public for the Class A hospitals, as the communities served by both groups are essentially the same.

General Organization with Limitations and Restrictions of Staff. Obstetric organization including the limitations and restrictions on the activities of the staff is much more difficult to evaluate in these two groups. The Class A hospitals have all been accepted by the American College of Surgeons as having fulfilled the minimum standards for obstetrics, and consequently a review of

*Presented at the annual meeting of the Massachusetts Medical Society, Boston, May 31, 1938.

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the standards should fairly well define these hospitals. The standards are as follows:

Accommodation: A properly organized and equipped department of obstetrics providing adequate accommodation for mother and newborn. Arrangements should be made to segregate this type of patient in a separate wing or floor of the hospital with separate personnel, sterilization equipment and supplies. Large open wards are not suitable for obstetric patients, but where such wards already exist they should be divided into cubicles by wood or glass partitions.

Provision for Isolation: Special facilities for the immediate isolation of all cases of infection, temperature or conditions inimical to the safety and welfare of other patients in the department. The rooms and facilities for isolation of these cases should be located outside the obstetric department and have no connection whatsoever with it. A special suite is sometimes prepared for this purpose, one having its own delivery room, equipment and supplies.

Personnel: Adequate and competent medical, nursing and non-professional staff for efficient care of the patient. The obstetric department should be in charge of a registered nurse with special training for this particular work. The entire nursing staff should be assigned especially for work in this department and should not be permitted to attend other cases during time on the obstetric service. As the obstetric nurse is in attendance with the patient a large share of the time during labor, she should be trained in observation of the patient's symptoms, particularly in noting abnormal conditions so that the obstetrician may be summoned in time. She should also be thoroughly trained in postpartum care since here again she is the first to observe dangerous sequelae and complications.

Facilities: Adequate laboratory and special treatment facilities under competent medical supervision. Routine laboratory examination must be made of all obstetric patients and particular attention paid to cardiac disturbances, toxemias and other complicating conditions of pregnancy and labor. The free use of the laboratory should be encouraged. More and more is the x-ray being used to ascertain the size and position of the fetus.

Records: Accurate and complete clinical records kept on all patients. An obstetric record should include: identification data; past history, with special reference to menstrual functions, pregnancies, miscarriages, labors and general health; general examination with special examination to determine duration of pregnancy, position and condition of child, measurements, condition of soft parts or any abnormalities which might be present; laboratory or other special examinations; provisional diagnosis; indications for operative procedures when carried out; history of labor; final diagnosis; postpartum progress; condition on discharge as revealed through examination; in addition there should be a complete history of the baby and its progress while in the hospital.

Consultation: Major obstetric operative procedures to be carried out only after consultation and indications for interference are recorded on the patient's record, except in cases of emergency when time will not permit. Frequency of consultations on the obstetric service should be encouraged, and made obligatory in all cases where major operative precedures are indicated.

Conferences: A thorough analysis and review of the clinical work of the department made each month with particular consideration of deaths, infections, morbidities and complications. This review should take place either in a special departmental conference or in the general staff conference.

Training: Adequate theoretical instruction and practical experience for the student nurses in prenatal, parturient and postpartum care of the patient as well as in the care of the newborn. They should be assigned to the department for their period of training in theory and practice of obstetrics, and work under competent supervision.

It is believed that at this time complete information regarding obstetric organization in the non-Class A hospitals would be impossible to obtain. The questionnaire was directed to the formation of staffs and to the question of limitation of their activities.

Of the sixty-eight non-Class A hospitals that replied to the questionnaire, forty-nine delivering 3090 babies expressed no restrictions whatever on the activities of their staffs. All but nine of these had no limitations to the admission to the staff except that they be licensed physicians in good standing. The remaining nineteen hospitals with 2093 deliveries expressed definite restrictions of staff activities, and six of them had limitations to admission. Restrictions in thirteen of them definitely specified consultations must be held on all operative procedures and that these must be done by qualified consultants. The remaining six had less well-defined restrictions, principally based on the necessity of having surgeons, not obstetricians, take care of the operative cases.

Facilities for Major Obstetric Surgery. There were ten hospitals which replied that they were not equipped to perform major obstetric surgery. Of these, eight were affiliated with a near-by Class A hospital. The remaining two did not specify to what hospitals their operative cases were transferred.

CONCLUSIONS

The scope of this paper does not justify definite conclusions. We do believe, however, that the following observations should be brought to the attention of the Society:

(1) The licensing power appears to be unsatisfactory. It does not seem justifiable that any individual may secure a maternity hospital license from the Department of Public Welfare, a lay board, merely by having his premises approved as sanitary by a local board of health. There is no provision in the statute for satisfactory standardization of obstetric equipment. The hospitals are only "subject to visitation and inspection" by the Department of Public Health. We feel that the licensing power might be placed more appro-

priately under the Massachusetts Department of Public Health or the Board of Registration in Medicine, with powers for regulation as well as inspection.

(2) One thousand four hundred and seventeen hospital beds, or 40 per cent of the entire number available for obstetrics, are distributed among one hundred and twenty-six hospitals. Of these beds 773, or 54 per cent, are in the forty-four Class A hospitals.

(3) Only ten hospitals reported that they were not equipped to care for major obstetric cases.

(4) The Class A hospitals delivered 10,600 cases in 1937, or about two thirds of the entire number delivered in the small obstetric hospitals. Of the remaining one third, 2093 were delivered in hospitals with restrictions on staff activities, and 3090 in entirely unrestricted hospitals.

Discussion

Dr. Samuel A. Cosgrove, Jersey City, New Jersey: Any survey of hospital conditions shows that what maintains practice on a lower plane than it should be is lack of efficiency in the control of the men privileged to work in that hospital, whether they be on the regular staff, or comprise what is generally known as the courtesy staff. Incidentally, I do not know why the maternity service should be the only one to which most of these hospitals admit doctors whom they do not think qualified for their staffs. Many of them will not let any practitioner do general surgery, but the same hospital heads who forbid that have no objection whatever to permitting any man who has satisfied the necessary minimum requirements for state licensure to handle obstetric cases, almost without any surveillance whatsoever.

We have had very little friction arising from the unwillingness of practitioners to have their private patients examined by our staff. This is so usual a procedure and they are included so naturally that we have not had over three explosions in seven years. Our staff members regularly examine private patients no matter whose service they are on, just as freely and naturally as they examine those on the wards.

There undoubtedly will be friction in old staff organizations, in attempting to institute such regulations, but if the attempt is persisted in and a little suavity and diplomacy are used, it will be worth while. Our present problem is to keep these practitioners from loading too much responsibility on the staff. Sometimes in the face of the slightest difficulty they tend to turn the entire conduct of the case over to our residents and make them consultants, as it were. We have to exert a little pressure to prevent that tendency from developing. In our own practice, the rule is applied even to the assistant obstetric staff, each service chief being held responsible for his own assistants.

THE DIAGNOSIS AND CONSERVATIVE TREATMENT OF ACUTE PANCREATITIS*

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SEVERAL years ago Henderson and King[1] analyzed a series of 60 cases of acute pancreatitis at the Boston City Hospital. The mortality rate was 53 per cent, which compares favorably with statistics for operative treatment at other clinics. Because the patients in this series who recovered were those who had been treated conservatively for four to six days before operation, the authors stated that they planned to be conservative in the treatment of acute pancreatitis in the future and to delay operation. In attempting to follow this policy during the past two years we have made an effort to perfect the diagnosis of acute pancreatitis, and for this purpose the urinary diastase test has been found to be of great value.

In this study no attempt has been made to determine the urinary diastase routinely in all acute abdominal conditions. The test has been used only where pancreatitis was suspected from the history and physical findings. Table 1 summarizes the important findings in 12 cases of pancreatitis. On the basis of these and other findings the indications for doing a diastase test may be given as follows:

Table 1. *Clinical and Laboratory Findings in 12 Patients with Acute Pancreatitis*

FINDING		NO. OF CASES
Elevated diastase test		12
Past history of biliary tract disease		11
Operation on biliary tract	4	
Acute attacks of upper abdominal pain	7	
Present history:		
Pain began in mid-epigastrium		12
Vomiting (severe in 10 cases)		12
Physical findings:		
Upper abdominal spasm		9
Tenderness maximum in mid-epigastrium and to left of midline		11
Temperature over 100°F. on admission		2
Jaundice		2

1. History of previous attacks of upper abdominal pain or of surgery of the biliary tract.

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2. Pain in the mid-epigastrium, boring through to the back or radiating around the left costal margin.

3. Severe vomiting.

4. Spasm (if present) limited to the upper abdomen.

5. Tenderness maximum in the mid-epigastrium and to the left of the midline. (This is the most constant of all physical findings.)

6. White-blood-cell count elevated above level which temperature, pulse and respiration would lead one to suspect. (A normal or only moderately elevated temperature and an increased pulse rate are common findings.)

METHOD

The urinary diastase determinations were performed by the method of Fabricius-Moller,[2] which is a modification of the original Wohlgemuth method. Its important feature is a buffered starch solution of pH 6.7, which is the optimum for diastase activity. For the substrate the following ingredients are used to produce a 0.1 per cent starch solution of pH 6.7:

Sodium chloride (NaCl)	4.50 gm.
Disodium phosphate (Na_2HPO_4 12 H_2O)	4.11 gm.
Potassium acid phosphate (KH_2PO_4)	5.13 gm.
Soluble starch	1.00 gm.
Distilled water	1000 cc.

These are boiled for half an hour, by the end of which time the soluble starch has been dissolved. The solution is filtered, placed in a stoppered flask and can be kept in an ice chest without deterioration for at least a month.

Specimens of urine taken on admission have been found to be sufficiently accurate for diastase determinations, although morning specimens are recommended when repeated determinations are run for comparison.

In each of a series of ten test tubes 2 cc. of the starch solution is placed. One cubic centimeter of the urine to be examined is added to 29 cc. of water, making a dilution of 1:30. To the series of test tubes containing the starch are then added 10, 9, 8, 7, 6, 5, 4, 3, 2 and 1 drops of diluted urine. Care must be taken to avoid getting saliva into the pipettes, as this will interfere with the results. The tubes are shaken to assure thorough mixture of the urine and starch and are placed in a water bath at a temperature of 38°C. for half an hour.

At the end of this time the tubes may be placed in cold water in order to stop the reaction, or iodine solution is added at once and the result read without this preliminary step. The iodine solution recommended by Fabricius-Moller[2] is N/200, or one containing 1 gm. of iodine and 2 gm. of potassium iodide in 1500 cc. of distilled water. However, a few drops of any iodine preparation will suffice as long as it is not too concentrated to mask the reaction.

Complete starch digestion is indicated by a clear solution with only the brown iodine color showing; in the tubes containing undigested starch the color is a dark blue. The end point, however, is not a sharp one at all times. One usually sees intermediate tubes in which the color is a deep red, indicating that hydrolysis has progressed only to the stage of dextrin. The last tube having a predominantly reddish color is accepted as showing diastase activity and is chosen as the end point.

At times the digestion of starch is complete in all the tubes. In this case 1 cc. of the 1:30 dilution of urine is added to 9 cc. of water. This makes a dilution of 1:300, which can then be run through a similar determination for an accurate end point. In calculating the diastase number, one uses the following formula: dilution of urine times number of cubic centimeters of starch solution times number of drops per cubic centimeter in pipette, divided by number of drops of urine in final tube. Thus the diastase number in a typical case where digestion is complete in the tube with one drop when the pipette calibrates 20 drops per cubic centimeter is

$$\frac{30 \times 2 \times 20}{1} = 1200$$

By this method, any value of 300 or less is within normal limits.

CLINICAL DATA

Table 2 gives in brief form the history, physical findings and laboratory data of the 14 cases studied. There were 15 admissions, 1 patient (Cases 4 and 11) having had two attacks of acute pancreatitis. Cases 1, 2 and 3 had histories and findings suggestive of acute pancreatitis but showed negative diastase tests. Of these, Cases 1 and 2 came to operation and showed ruptured gall bladders with bile peritonitis. Case 3 had a marked alcoholic history and recovered without operation from what was probably acute alcoholic gastritis.

In Cases 4, 5 and 6 the patients were seen during the early part of this study and were operated on under wrong preoperative diagnoses. In Case 4 there was a delayed operation and in Cases 5 and 6 there were immediate operations. In all there was fat necrosis and the urine specimens obtained immediately after operation had markedly elevated diastasuria. In retrospect these patients should have been suspected of having pancreatitis, and their cases would no doubt now be diagnosed correctly.

Cases 7 to 15, inclusive, were all diagnosed as acute pancreatitis on admission. Cases 7 and 8 came to immediate operation, whereas Cases 9, 10 and 15 were treated conservatively for varying periods of time and later came to operation. Cases 11, 12, 13 and 14 had only conservative treatment. Of the 9 cases diagnosed as pancreatitis on admission, all 5 which came to operation showed evidence of this disease. Four of these showed fat necrosis and 1 marked edema about the duodenum and an enlarged, firm pancreas.

In the group of 12 cases of pancreatitis, 3 of the 4 patients (Cases 6, 7 and 8) coming to immediate surgery died. All 4 patients (Cases 4, 9, 10 and 15) having delayed surgery after the acute symptoms of pancreatitis had subsided survived. All 4 patients (Cases 11, 12, 13 and 14) having only conservative treatment recovered.

Pancreatitis is a disease with wide extremes of severity. In evaluating these cases from this standpoint one finds that among those treated conservatively 5 of 8 patients (Cases 9, 10, 12, 13 and

14) could be classified as being severely ill on admission, judging from the general state, pulse, abdominal signs and white-cell count. Three of these patients (Cases 4, 11 and 15) could be classed as moderately ill. Two (Cases 6 and 7) of 4 patients having immediate operation were severely ill and 2 (Cases 5 and 8) were moderately ill. Clinically it is very difficult to draw any line between these two groups as a whole. Certainly in the 3 fatal cases that came to immediate operation the patients were no sicker than many that had expectant treatment, for none were in shock and in none was the temperature over 100°F. or the pulse over 100 on admission.

Table 2. *Summary of 15 Cases with a Questionable Diagnosis of Acute Pancreatitis.*

CASE NO.	AGE	SEX	HISTORY	PHYSICAL EXAMINATION	LABORATORY DATA	TREATMENT AND COURSE
1	45	F	Cholecystostomy for acute pancreatitis 5 mo. before. Sudden pain in right upper quadrant 4 days before admission; severe pain 12 hr. before admission. Severe vomiting.	General tenderness and spasm, maximum in right upper quadrant.	T. 101.4, P. 130, R. 23, W.B.C. 40,000, D.T. 200.	Operation; perforated gall bladder found, with bile peritonitis. Recovered.
2	51	M	Two similar attacks, 1 and 2 mo. before. Severe pain in right upper quadrant 12 hr. before admission, shifting to left lower quadrant. Induced vomiting.	General tenderness and spasm, maximum in right upper quadrant; jaundice.	T. 100.8, P. 70, R. 20, W.B.C. 15,000, D.T. 180.	Operation; perforated gall bladder found, with bile peritonitis. Recovered.
3	35	F	No previous attack. Severe pain in epigastrium with marked vomiting 6 hr. before admission. Marked alcoholic history.	General tenderness, maximum in left upper quadrant; no true spasm.	T. 99.4, P. 100, R. 20, W.B.C. 15,000, D.T. 180.	No operation. Recovered. Probably alcoholic gastritis.
4	42	F	Gas and belching after meals. Severe pain in epigastrium with marked vomiting. Began 24 hr. before admission.	Upper abdominal tenderness, maximum in midline; slight upper abdominal spasm.	T. 99.2, P. 82, R. 20, W.B.C. 7,000, post-op. D.T. 720.	Exploratory operation 4 days after admission; pancreatitis found. Later cholecystectomy. Recovered.
5	26	F	Similar attack 9 mo. before, diagnosed as acute pancreatitis. Sudden onset of severe pain in mid-epigastrium with severe vomiting 1 hr. before admission.	Upper abdominal spasm and tenderness, maximum over pancreas.	T. 98.0, P. 80, R. 20, W.B.C. 17,000, post-op. D.T. 2000.	Immediate operation; fat necrosis found. Gall bladder drained. Recovered.
6	52	M	Three similar attacks of epigastric pain during last 2 yr. Sudden, severe epigastric pain 5 hr. before admission. Vomited twice.	General abdominal spasm and tenderness, maximum in left upper quadrant.	T. 100, P. 100, R. 20, W.B.C. 20,000, post-op. D.T. 22,000.	Immediate operation; fat necrosis found. Gall bladder drained. Died.
7	64	M	No previous attacks. Gradual onset of epigastric pain 24 hr. before admission, increasing until admission. Severe vomiting.	Upper abdominal spasm and tenderness over entire abdomen, maximum in right upper quadrant and over pancreas.	T. 99, P. 90, R. 20, W.B.C. 20,000, D.T. 600.	Immediate operation; acute cholecystitis and acute pancreatitis found, with slight sealed-off perforation of gall bladder. Died.
8	58	M	Two similar attacks 3 and 6 mo. before. Severe mid-epigastric pain 8 hr. before admission. Severe vomiting.	Upper abdominal spasm, maximum in mid-epigastrium.	T. 98, P. 100, R. 20, W.B.C. 15,500, D.T. 6000.	Immediate operation; fat necrosis found. Gall bladder drained. Died.
9	28	F	Nausea and epigastric distress 1 yr. before. Sudden severe epigastric pain 1 hr. before admission. Severe vomiting.	Upper abdominal spasm and tenderness, maximum over pancreas.	T. 98, P. 120, R. 25, W.B.C. 26,000, D.T. 600.	Conservative treatment for 4 days. Exploratory operation for possible acute gall bladder; only fat necrosis found. Recovered.
10	40	F	Four similar attacks during last 2 yr. Pain in mid-epigastrium 12 hr. before admission. Severe vomiting.	Slight upper abdominal spasm; tenderness in mid-epigastrium and over pancreas.	T. 99, P. 90, R. 25, W.B.C. 18,700, D.T. 600.	Conservative treatment for 2 wk. Later cholecystectomy and choledochostomy. Recovered.
11	42	F	Same as Case 4 (6 mo. later). Sudden, severe pain in epigastrium began 12 hr. before admission. Severe vomiting.	No spasm; very tender over pancreas and right upper quadrant.	T. 100, P. 100, R. 20, W.B.C. 15,000, D.T. 600.	Conservative treatment. Calcium bilirubin crystals found in duodenal drainage; magnesium sulfate prescribed. Recovered.
12	55	F	Gall bladder drained 25 yr. before. Severe pain in epigastrium radiating to left shoulder 24 hr. before admission. Vomited four times.	Upper abdominal spasm; tender over pancreas.	T. 100, P. 80, R. 20, W.B.C. 19,000, D.T. 6000.	Conservative treatment. Discharged on fourth day against advice. Recovered.
13	56	F	Cholecystectomy with exploration of duct 5 wk. before admission. Severe chill, mid-epigastric pain and vomiting 3 hr. before admission.	Upper abdominal spasm and tenderness; jaundice.	T. 103, P. 120, R. 30, W.B.C. 30,000, D.T. 1500, I.I. 30.	Conservative treatment. Icteric index normal in 5 days; left hospital in 1 wk. Well 1 yr. later.
14	39	M	Gall bladder removed and duct explored 3 mo. before admission. Severe epigastric pain with much vomiting 4 hr. before admission.	Upper abdominal spasm and tenderness, maximum over pancreas.	T. 100, P. 95, R. 22, W.B.C. 24,000, D.T. 1900.	Conservative treatment. Duodenal drainage showed calcium bilirubin crystals. Discharged on magnesium sulfate.
15	24	F	Repeated right upper quadrant pain for 4 yr. Sudden, severe epigastric pain 3 days before admission. Severe vomiting.	No spasm; maximum tenderness in midline; jaundice.	T. 99.4, P. 110, R. 22, W.B.C. 11,600, D.T. 1200, I.I. 50.	Conservative treatment for 1 wk.; icteric index fell to normal. Operation; gall bladder, with stones, removed. Recovered.

T. = temperature (°F.); P. = pulse rate; R. = respiratory rate; W.B.C. = white-blood-cell count; D.T. = diastase test; I.I. = icteric index.

The treatment given to patients that were not operated on immediately consisted of parenteral fluids, gastric lavage and sedation, largely in the form of barbiturates. Morphine was used sparingly because of its contracting effect on the sphincter of Oddi. A nasal tube was left in place for purposes of aspiration and gavage. Three times a day 12 cc. of 50 per cent magnesium sulfate was introduced into the nasal tube in order to facilitate drainage of bile into the duodenum. When the patients were sufficiently recovered a Graham test was performed, provided the gall bladder was present; if it was not, a duodenal drainage was done. When stones were present in the gall bladder or there was evidence of a diseased gall bladder, treatment consisted in exploration and cholecystectomy. In some cases the common duct was explored. This exploration was not performed routinely in patients who had had previous cholecystectomy or who showed cholesterol or calcium bilirubin crystals in the bile sediment. They were instructed to take small doses (4 gm. twice a day) of Epsom salts daily for an indefinite period, and to the date of writing, this treatment has given good results.

DISCUSSION

The diagnosis of pancreatitis is a perplexing problem to the surgeon, but from the experiences reported in this paper and those of others[3, 4, 5] it seems fair to say that the diagnosis can be made with considerable accuracy when the clinical facts are used in conjunction with the urinary diastase. However, one cannot use the urinary diastase test alone as an infallible diagnostic procedure, for as Foged[6] has shown, it is positive in carcinoma and ulcer invading the head of the pancreas (41 per cent), uncomplicated cholelithiasis (17 per cent), cholecystitis (12 per cent) and stone in the bile ducts (69 per cent).

In most cases one can readily exclude acute pancreatitis by history and physical examination, but confusion is most likely to arise in patients with acute cholecystitis and stone in the common duct. In the former condition the predominant symptoms are referred to the right upper quadrant and the maximum signs are found over the region of the gall bladder. When pancreatitis is present concomitantly with acute cholecystitis one finds the same signs, but in addition there is also exquisite tenderness over the pancreas, and if spasm is present it is likely to extend across the entire upper abdomen. The differentiation of stone in the common duct and pancreatitis may be quite difficult, but the presence of jaundice, chills and a temperature of over 100°F. favors the former diagnosis, whereas upper abdominal spasm and deep tenderness over the course of the pancreas favor the latter.

Once the diagnosis of early acute pancreatitis has been established or is reasonably certain, conservative treatment seems to afford the patient the best chance for recovery. This method of therapy has recently been advocated by a number of authors.[3, 4, 5, 7, 8] Among these the work of Mikkelsen[3] is most convincing. He reports a mortality of 7.5 per cent in 39 cases of pancreatitis treated conservatively. Smead[8] gives a lucid discussion on the rationale of conservative therapy and provides an extensive bibliography.

Drainage of the gall bladder or pancreas or both are the surgical procedures that have been used in treating acute pancreatitis. If one drains the gall bladder the pancreatic system is drained no more effectively than if bile flows freely into the duodenum; furthermore, this flow can be facilitated by duodenal drainage and stimulation with magnesium sulfate. In patients with pancreatitis and jaundice the obstruction is in the region of the ampulla; hence, drainage of the gall bladder even in this type of case does not permit drainage of the pancreatic secretion. The only valid indication for surgery on the biliary tree in acute pancreatitis is an associated acute cholecystitis. Even here one can afford to delay, with the expectation that the acute symptoms will subside.

By placing drains as far down as the pancreas, one does not drain the pancreas, for this organ is made up of lobules each of which is sheathed in its own compartment of connective tissue. Incision of the pancreas, or its overlying peritoneum, in addition to being a hazardous procedure, merely drains the lobules so incised and encourages the formation of a fistula by diverting the flow of pancreatic juice to the exterior.

Many patients with pancreatitis come to surgery later when the acute attack has subsided. While a few require drainage of a pancreatic abscess or pseudocyst, the majority needing operation require cholecystectomy and choledochostomy. When surgery is to be performed it can be done with far greater safety if delayed until the acute phase of pancreatitis has subsided.

A patient who has had a cholecystectomy and develops an attack of pancreatitis presents somewhat of a problem if one finds calcium bilirubin crystals or cholesterol crystals or both in the biliary sediment. These crystals confirm the presence of sand or stones in the common duct, but they do not indicate the size of these elements. Since the latter may be very small and be readily passed when the sphincter of Oddi is relaxed, it seems logical to try daily doses of magnesium sulfate and some time later to repeat the duodenal

drainage, before resorting to surgery. However, this phase of the treatment is still in an experimental stage.

SUMMARY

In 15 cases the urinary diastase test has been of great value in selecting those in which there was pancreatitis.

The test should be used in conjunction with clinical evidence in establishing this diagnosis.

Of 4 patients with acute pancreatitis coming to immediate surgery, 3 died. Four patients with this disease that had delayed operation survived. Four patients treated only by nonoperative methods survived. Three patients with symptoms and signs of pancreatitis that showed negative diastasuria proved not to have had the disease.

The rationale of conservative treatment in acute pancreatitis is discussed.

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PULMONARY TUBERCULOSIS IN OLD PEOPLE*

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PULMONARY tuberculosis in the aged may remain quiescent for many years and cause little clinical reaction. However, when exacerbations occur manifestations of a severe nature may supervene. The disease may at this time become a serious problem, and may cause a fatal termination in a short time after the appearance of clinical activity.

In recent years a number of papers have called attention to this important subject. The writers have emphasized that contrary to common belief, tuberculosis in old age may be anything but a mild phenomenon. The development of a more critical attitude toward this phase of the disease is undoubtedly due to more careful study of such cases, especially when bedside observations are supplemented with serial roentgenography. Since rather marked progressive changes may occur in the lungs without producing striking clinical phenomena, the importance of frequent radiographic examination should be emphasized.

According to the observations of Rubin,[1] the average death rate from tuberculosis for all ages is exceeded by the death rate in the age groups over fifty years of age. Schlesinger[2] concludes that the increased death rate in the aged reaches the peak in the seventh decade of life. Aráoz Alfaro[3] stresses that tuberculosis in old people is apt to be rapidly progressive and exhibit severe clinical manifestations. Müller-Deham[4] believes that the disease in the aged tends to disseminate rapidly because of the high level of tuberculo-allergy attained at this age. Banyai[5] finds that while the fibrotic type of lesion is the commonest one in these patients, the prognosis is generally grave in the presence of caseation with involvement of more than one lung. Jullien[6] is inclined to give a poor prognosis generally to this age group.

The clinical course usually runs parallel with the nature of the pathologic changes. The cases may be classified as follows: latent apical, chronic fibroid, fibrocaseating. In the latent apical variety of tuberculosis the lesion as seen on the radiograph consists of well-delineated elements of fibrosis involving one or both apices; loss of lung substance because of fibrosis is negligible; areas of calcification are common; and caseation is conspicuously absent. The chronic fibroid type of tuberculosis is characterized by marked fibrous proliferation; calcified nodules are usually in evidence; if elements of caseation are present, they are very limited in extent. The fibrocaseating type consists of a variable degree of fibrosis upon which is superimposed a caseating, conglomerate tubercle. The latter may be very extreme, and is usually so active that liquefaction necrosis with cavitation occurs in the majority of cases. Rubin[1] found nearly always in the fibrocaseating group clinical and roentgenologic evidence of bilateral disease with cavitation. The lesions observed by him at autopsy were like those found in young adults; that is, they showed fresh caseation and recent excavation of lung parenchyma.

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Aside from the fact that the lesion in the aged may be of a severe nature, these patients often present difficulties in physical diagnosis. It is well known that people past middle life suffer from varying degrees of bronchitis, emphysema and myocardial insufficiency. Should active tuberculosis supervene, the significance of presenting signs will be more difficult to evaluate. Signs denoting tuberculous infiltration, namely dullness, increased breath sounds and rales, may be obscured by hyper-resonance, diminished respiration, sibilant and sonorous rhonchi occurring in emphysema and bronchitis, and rales caused by passive congestion incident to myocardial insufficiency. Hence, while ill-health may be caused by non-tuberculous disease, the presence of the latter may be only the complication of active and debilitating phthisis.

As regards classical signs and symptoms found in these cases, it should be emphasized that those commonly observed in young adults have their counterpart in the aged. Especially is this so in cases which have the caseation type of lesion. Such complications as hemorrhage, excavation and pneumonic spread, seen in the young, are apt to appear in the aged as well.

This report presents data drawn from an unselected group of elderly patients. The objective is to evaluate the findings with reference to the frequency and severity of manifestations of active tuberculosis found in senescents. The number of cases studied was 60, the ages ranging between fifty and seventy-eight. There were 24 women and 36 men. All the women were housewives except 1, who was a cook. The occupational incidence among the men was as follows: gas fitter, paper-sorter, teacher, butcher, peddler and carpenter, 2 rag-sorters, 3 cobblers, 4 painters, 5 tailors and merchants and 11 laborers. The estimated duration of the disease based on the history of symptoms was as follows: 16 patients noted the onset of symptoms six months or less prior to diagnosis, 6 one year or less, 14 five years or less, 3 ten years or less, 18 twenty years or less and 3 over twenty-five years. The follow-up was routine in nature and extended over several years, except for a small number of patients who died soon after coming under observation. The contact with these cases was personal, occurring through my association with the Pulmonary Clinic of the Beth Israel Hospital and the tuberculosis clinics of the Boston Health Department. The mode of onset, symptomatology, physical signs, sputum examination and radiographic shadows were studied. Complications, when definite, were noted. End results were tabulated, either through the clinical course or by termination in death.

ANALYSIS OF CASES

Classification into various types as adopted by Rubin[1] was employed, and was based on radiographic findings. Twelve cases were latent apical, 18 were chronic fibroid and 30 were fibrocaseating. Of the last, 28 had undoubted cavities. The onset of clinical activity was acute in 23 cases and insidious in 37. Weakness was complained of in 38 cases. Weight loss occurred in 26 cases; in 6 of these it was very severe. Cough and expectoration were present in all but 3 cases. Hemoptysis occurred in 10 cases; in 2 of these there was profuse and recurring hemorrhage. Constant and recurring chest pain was interpreted as pleurisy; 21 patients had this complaint, and 1 of them had an associated pleural effusion. Dyspnea of varying degrees was present in 25 cases. Twelve had fever, and the same number of patients complained of profuse night sweats. Fifteen patients had anorexia or gastric disturbances.

Physical examination revealed the following: Apical rales were present in 33 cases, and basal rales in 3. Of great clinical interest was the fact that in 24 cases no rales were heard at the apices. Signs of cavity were made out on physical examination in only 12 cases, while the presence of cavity was detected by x-ray in 26. Associated conditions noted were diabetes mellitus, 8 cases; emphysema, 8; bronchial asthma, 3; bronchitis, 2; aneurysm, 2; and hypertensive heart disease, 3.

Of 52 cases in which complete follow-up was possible, 29 were "improved." Of these, 10 were latent apical, 8 chronic fibroid and 11 fibrocaseating. Six remained "unchanged," as follows: 1 latent apical; 2 chronic fibroid; 3 fibrocaseating. Nine cases became "worse," as follows: 1 latent apical; 2 chronic fibroid; 6 fibrocaseating. Death occurred in 8 cases—3 of diabetes and 5 uncomplicated. The entire fatal group presented bilateral fibrocaseating disease. Of the 8 diabetic patients, 3 died three to four months following entry, while 5 showed absorption of parenchymal exudate and development of fibrosis two to three years after the diagnosis of combined disease was established.

A critical review of the group presented shows the following findings of interest. Thirty patients presented caseation besides fibrosis; of this number 24 had cavities. The latter group presents a definite variance from the generally accepted concept that tuberculosis of senescence is of the chronic fibroid variety, with the implication that the lesions are benign. Likewise, contrary to general opinion, we find that in over one third of

the cases the disease was manifested by an acute onset. The seriousness of tuberculosis can further be attested by the occurrence of hemorrhage in 10 cases. Also, the relatively high incidence of manifest toxemia in these patients is borne out by the occurrence of night sweats in 10 cases and fever in 12.

As regards physical findings, the following is of considerable clinical interest. No apical rales were elicited in 24 cases, while 12 showed signs of cavity and 26 showed cavernous disease on radiographic examination. Sputum examination was of interest, since it was positive in 23 cases among 52 in which it was done; the ordinary stained-smear method was used. Undoubtedly a greater incidence of positive sputum cases would have been found if other methods had been employed.

A brief review of the outcome in these cases brings to light pertinent information on the matter of prognosis. Of the 52 properly followed cases, about one half improved and one half did not. Of the 29 "improved" cases 18 belonged to the latent apical and chronic fibroid types and only 11 were fibrocaseating. In the group noted as "worse," there were 1 latent apical, 2 chronic fibroid and 3 fibrocaseating cases at the beginning of the observation period.

SUMMARY

In spite of the small number of cases in the series reported, one is able to obtain impressions which I believe to be valuable. The clinical as well as the radiographic findings serve to negate in a large measure the optimism commonly entertained regarding the aged tuberculous patient. Symptoms of fever, hemorrhage and night sweats were of relatively frequent occurrence. Certainly these phenomena can hardly be considered mild in character. Likewise, the finding of cavitation in nearly 50 per cent of the group designated as fibrocaseating phthisis points to severe evolutionary possibilities in the lungs of the aged. Other findings appear pertinent. For example, in nearly half the cases rales were not heard over the apices known to have infiltration. The latter finding bears out the observations of Rubin,[1] who has noted the relative frequency of negative stethoscopic findings in the chests of elderly patients known to have tuberculosis of varying degrees. The end results are of much interest, since the incidence of "unchanged," "worse" and "dead" cases is much greater among the fibrocaseating type than among the latent apical and chronic fibroid types. Lastly, the large proportion of cases in which symptoms were present for very many years without recognition of the presence of the disease should bring forcibly to mind the epidemiologic significance of tuberculosis in the aged.

CONCLUSIONS

Severe clinical manifestations are relatively common among tuberculous patients over fifty years of age.

The caseating type of lesion with cavity formation is found quite frequently in the age group discussed.

The value of consistent radiographic examination in conjunction with clinical study cannot be overemphasized.

Pulmonary tuberculosis in the aged, contrary to the common concept, should be considered as serious a disease as it is in the young.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 24481

PRESENTATION OF CASE

A fifty-four-year-old, single Polish woolen-mill comber entered complaining of epigastric pain.

Since childhood he had had frequent "stomach-aches." Twenty-five years before entry he had had an episode of pain and distress, more severe before meals. He was treated for a year with many types of medicine which gave little relief until the end of that period. Since that time episodes of short duration and varying severity recurred. These consisted of preprandial and postprandial pain, — always between the xiphoid and umbilicus, — nausea without vomiting, loss of appetite, intolerance to rough and sour foods and continuous malaise. One year prior to entry he had had an attack of "mushroom poisoning" and vomited for three days. Following that he was constantly "uneasy about his stomach." His weight, however, had remained constant at 145 pounds. Six months before entry his pain became much worse. Eating caused a sense of constriction just above the umbilicus. He stopped solid foods, smoking and coffee, without relief. Weakness increased and he began to lose weight, losing a total of 27 pounds in six months. He had noted an occasional black streaking of his stools.

His past and family histories were noncontributory.

Physical examination showed a small, spare man in no acute distress. The right pupil was larger than the left, but the reactions were normal. The left tonsil was large and cryptic. No lymph nodes were palpable. Examination of the chest was essentially negative. The blood pressure was 115 systolic, 80 diastolic. The edge of the liver was palpated 3 cm. below the costal margin and was somewhat tender beneath the tip of the xiphoid. No masses were found. There was tenderness without spasm in the right lower quadrant, which was referred toward the umbilicus.

The temperature was 99°F., the pulse 80, the respirations 20.

Examination of the urine was negative. The blood showed a red-cell count of 4,460,000 with 80 per cent hemoglobin, and a white-cell count of 5300 with 68 per cent polymorphonuclears. The serum nonprotein nitrogen was 21 mg., the protein 7.4 gm. and the carbon-dioxide combining power 63.0 vol. per cent, and the chlorides were equivalent to 99 cc. of N/10 sodium chloride. A stool examination gave a 3+ guaiac reaction. A gastric analysis showed no free acid.

X-ray films showed a normal esophagus. Beginning just below the esophageal orifice, and extending along both curvatures, was a large ulcerating lesion which reached the pylorus. There was no evidence of obstruction. The pylorus opened readily, filling a normal cap. The visualized small bowel appeared normal. X-ray films of the chest were normal.

On the seventh hospital day an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. GEORGE A. LELAND: Looking back at the past history there seems to be quite a chronic situation. We should say automatically, I think, that the patient had an ulcer, with more or less gastritis. There is no story of excessive alcoholism. It would appear that whatever his gastric disease may have been, it took a decided turn for the worse during the immediately past six months. During that time, as before, his outstanding symptom seems to have been pain. He tried to prevent the pain by avoiding certain foods as he had done in the past, but this time he obtained no relief. He steadily went downhill and lost weight. There was still no vomiting recorded.

"The left tonsil was large and cryptic." The tonsil has a right to be cryptic in an anatomical sense but it should not be large unless the other tonsil is large too. Perhaps that is where the observation about its being cryptic comes in.

He had a large liver, or at least a slightly low one. It was 3 cm. below the ribs, which is not extraordinary, but our attention is drawn to it. Tenderness without spasm in the right lower quadrant is not necessarily significant. Tenderness alone, of course, is not infrequently found. The blood picture was quite good for a man who has had trouble for a long time with blood streaking of his stools and with a rapid loss of weight which one feels is due to a malignant process of the stomach.

On the whole the chemical findings in the blood were not too bad for an individual with an obvious gastric lesion. The guaiac was 3+, which one would expect to find with blood streaking of the stools. There is little need for comment about the gastric analysis, but it comes to me that I have recently heard that the absence of acid is of great significance. We shall have to bear that in mind.

May we see the x-ray films?

Dr. Richard Schatzki: In these films that we have here the stomach contains comparatively little barium and, therefore, one cannot judge accurately as to the elasticity of the stomach wall. It was checked by the fluoroscopist, and he apparently thought that the stomach wall was rigid. The barium-filled stomach shows a very abnormal surface, and the only area where one might think that there are definite rugae is along the greater curvature. These rugae are unquestionably thickened. Along the lesser curvature, starting from the cardia and going down to the pylorus, I cannot see normal rugae in any of the films, and instead of the rugal pattern one sees this basin-like shadow filled with rather homogeneous barium consistent with ulceration. It is comparatively well defined against the rugae of the greater curvature of the stomach. The lesion involves the greater curvature in the region of the antrum, where rugae are no longer visible in any of these films.

Dr. Leland: We shall suppose that this individual who has chronic indigestion suffered for a good many years from ulcer or gastritis, very likely both. A very different kind of indigestion is noted six months before entry. The loss of weight, the presence of bloody stools both by personal observation and laboratory examination, the absence of acidity in his gastric contents and the lesion which we see by x-ray all point to a malignant process of one sort or other. It can be argued that he had ulcer for a great many years which suddenly became malignant. On the other hand this lesion which is demonstrated by x-ray is not small; it involves practically the whole stomach. So I should be inclined to think that it did not originate from one single ulcer. He had a large liver which is consistent with metastases from gastric cancer or with the presence of some other tumor. We have a change in the size of the pupil (perhaps due to pressure on the cervical sympathetic nerve) on one side and this left tonsil which is enlarged but not otherwise noteworthy. On the law of chances this man had a malignant tumor of the stomach, and the operator went in with the idea of finding a condition for which he could do a complete gastrectomy. On the other hand he might have had the suspicion that perhaps this case was a lymphoma of the stomach, with ulceration and with other evidence of lymphoma about the body, such as an enlargement of the tonsil, of the liver and of deep cervical nodes causing pressure on the sympathetic cord. In any event I believe that if the stomach were removable he would have been justified in doing so. I am inclined to think, however, that when he operated he was disappointed and found an inoperable condition. So my diagnosis is a malignant tumor of the stomach and I will be bold enough to say he had a lymphoma, with carcinoma as the next possibility.

Clinical Discussion

Dr. Tracy B. Mallory: Cases such as this one with a very prolonged history of gastric disorder terminating in a picture that is fairly evidently neoplastic are very interesting. We have had a number of them. Some of them could be interpreted as malignancy developing from a benign ulcer. It seems to me that very few of them have to be interpreted that way, however, and when Dr. Allen has told us about the operation, I shall tell you why I do not believe we have to interpret this case in that fashion.

Dr. Arthur W. Allen: We explored this man hoping that we might be able to do a total gastrectomy as Dr. Leland has suggested. It was the only operative procedure contemplated, and we were prepared to find that the lesion was out of bounds, that he had metastases in the liver, and so forth, but we did not. The disease was fairly well confined to the stomach and the lymphatic areas in the gastrohepatic omentum and the great omentum. The entire great omentum and the whole stomach were removed with comparative ease. This was one of the easiest total gastrectomies that we have done. Anastomosis was made between a loop of jejunum and the esophagus, suturing the jejunum to the diaphragm to take the strain off the suture line between the jejunum and esophagus. An enteroenterostomy was done between the two loops of jejunum, and then a jejunostomy for feeding. The patient bore the operation very well, was in good condition the next day and the day following and then had a turn for the worse; Dr. Adams is going to describe the theories of bilateral pneumothorax because this is the only instance of fatal complication of this sort that we have had in dealing with total gastrectomy. We have done in this institution 24 total gastrectomies — 22 for cancer, 1 for lymphoma and 1 for a large benign ulcer that was thought to be cancer at the time of operation. Three of the patients had extensive involvement of the pancreas, and in these cases a large portion of the pancreas was removed with the stomach. Two had the transverse colon removed with the stomach because of the involvement of blood supply of the transverse colon. In one instance the transverse colon, the pancreas, the spleen and the entire stomach were removed. This all seems radical perhaps, and we know that we must expect a large number of failures in such a group of

patients. We have had a mortality, including these complicated cases, of 50 per cent; twelve out of 24 survived and left the hospital. One is living over four years since the operation, and he had a very malignant type of tumor with nodal involvement. Another lived three years, and two or three are still living, some still free of disease and some with disease. It is a well-worthwhile procedure because these individuals have absolutely nothing to look forward to. Death from cancer of the stomach is a particularly uncomfortable one. I had the misfortune of watching one of my friends die of this disease six or seven years ago, and it is not the type of exitus I should wish on my worst enemy. When you have removable tissue I think it is justifiable to do total gastrectomies in this group of cases.

This man succumbed to a bilateral pneumothorax.

Dr. Ralph Adams: My explanation of this fatality is based on a theory and not on fact.

Air can be introduced very easily into the pleural cavities of a dog when doing an upper abdominal operation, because of the peculiar anatomy. This also may be true of certain types of people and possibly explains how air is introduced into one side of the chest in doing a high abdominal paramedian incision. The parietal pleurae are very closely approximated to each other, and to the esophageal hiatus, along the posterior mediastinum of certain individuals. Dr. John D. Stewart has seen, at operation in the posterior mediastinum, pleurae which were almost contiguous, and during manipulation of the esophagus in such an operation as this it would be quite possible for both pleurae to be entered unknowingly by the operator.

Let us assume that necessary manipulation of the esophagus was accompanied by pin-hole perforations of both pleurae. The negative pressure of inspiration then could repeatedly aspirate small quantities of air through the suture line from the jejunum, where lay the open end of a stomach tube. The pneumothorax, being bilateral, was not diagnosed clinically and continued to accumulate until the patient died.

Clinical Diagnosis

Carcinoma of stomach.

Dr. Leland's Diagnosis

Lymphoma of stomach.

Anatomical Diagnoses

Polyposis of stomach with malignant degeneration.
Gastric carcinoma.
Pneumothorax, bilateral.
Mediastinal emphysema.
Operative wounds: total gastrectomy, esophagoenterostomy, enteroenterostomy, jejunostomy.

Pathological Discussion

Dr. Mallory: Aside from the bilateral pneumothorax we found nothing that seemed of significance in the autopsy. All the various surgical suture lines were watertight, and there was no evidence of a significant amount of infection about any of them. The resected stomach is a very interesting specimen. I think you can see clearly at the left-hand margin and again here at the right-hand margin two raised nubbins of tissue which are fairly characteristic of benign gastric polyps. In between and extending across almost the whole stomach, there is a zone of shallow ulceration that is malignant throughout. The gastric rugae on either side of that are enormously thickened, and sections through them show a picture that I cannot remember having seen before. The lymphatics throughout the mucosa are distended to twenty or thirty times their normal size with masses of cancer cells, many of them lying perfectly free and looking almost as if they were swimming in the lymph. In spite of that there was little metastasis to the lymph nodes, and the liver was entirely free. The latter was not enlarged but low. I think in this case that the twenty-year story of indigestion was unquestionably due to gastric polyposis and that malignancy developed only very recently.

A Physician: Is there any explanation for the patient's improvement for two days?

Dr. Mallory: There must have been a delay in the passage of air into the pleural cavities. We found nothing anatomically to indicate why there should have been a delay.

CASE 24482

Presentation of Case

A fifty-two-year-old single Polish laborer entered complaining of puffy eyelids and swollen ankles of three weeks' duration.

Throughout the winter and spring preceding entry he worked regularly and hard, loading freight cars and trucks. Four weeks before entry he had an upper respiratory infection with rhinitis and a nonproductive cough. One week later both eyelids and feet became swollen. Two weeks before entry he stopped work because he felt tired and weak. He became progressively weaker and noted intermittent puffiness of the eyelids. His ankles and feet became tender and swollen, per-

haps less so in the morning. No specific cardiac or urinary symptoms could be elicited.

Physical examination showed a well-developed, pale, undernourished, acutely ill man. There were left periorbital edema and pitting edema of both feet. The teeth were carious, with extensive pyorrhea. The tongue was rough and moderately coated. Examination of the lungs was negative. The heart was enlarged to the left, and the sounds were of poor quality. P_2 was greater than A_2. A harsh systolic murmur was heard over the aortic area and base, loudest on expiration. It was transmitted to the neck, but there was no thrill. The blood pressure was 105 systolic, 60 diastolic. Abdominal examination was negative.

The temperature was 99.6°F., the pulse 100, the respirations 25.

Examination of the urine showed a large trace of albumin, a specific gravity of 1.018, 4 to 8 red cells and 15 to 20 white cells per high-power field and many cellular casts. The blood showed a red-cell count of 3,400,000, 60 per cent hemoglobin, and a white-cell count of 8100 with 69 per cent polymorphonuclears. The serum protein was 4.7 gm., the nonprotein nitrogen 51 mg. and the phosphorus 4.72 mg. per cent. The carbon-dioxide combining power was 50.9 vol. per cent. A blood culture, Hinton test, spinal-fluid examination and Takata-Ara test were all negative.

X-ray films showed an enlarged heart, particularly in the region of the left ventricle. The aorta was tortuous, elongated and slightly dilated. There was fluid in the left pleural cavity. The hilus shadows were increased in size, and there was decreased density in the midportion of the right lower lung field. X-rays showed markedly increased density in the upper part of the abdomen. The liver appeared increased in size, but not the spleen. The kidney shadows seemed larger than usual, of normal shape and homogeneous. An intravenous pyelogram showed excretion of a rather poorly concentrated dye into both kidney pelves. The pelves were not dilated. The calices were incompletely outlined and rather long. No pressure defects were seen.

An electrocardiogram showed inversion of T_1 and T_4 and low voltage.

On the third hospital day the patient was unmanageable and sullen. He was apparently disoriented the preceding night. Dependent edema was marked. On the seventh day he lay quietly, occasionally mumbling unintelligently. His temperature had varied from 100 to 102°F. since entry, and his pulse from 50 to 90. Respirations remained constantly at about 20. The specific gravity of the urine remained close to 1.020; the large trace of albumin persisted. The urine contained many red cells and white cells on three examinations. One examination showed no casts, another granular debris, but four others many and varied casts. The blood red-cell count at this time was 4,200,000, with 60 per cent hemoglobin. On the fifteenth hospital day the patient's appetite was extremely poor; he was losing weight rapidly. His serum nonprotein nitrogen was 56 mg., protein 5.3 gm. and carbon-dioxide combining power 47.6 vol per cent. The following day a phenolsulfonephthalein test was attempted, but the patient would not void on time. At eighty minutes a specimen with 40 per cent was obtained.

On the nineteenth day the temperature was almost within normal limits — 98 to 100°F. The patient's appetite was better; there were no skin lesions and no edema. An electrocardiogram showed no change. Blood cultures were sterile. Six days later he seemed still better, with no symptoms except an occasional headache. On the thirty-first hospital day the harsh basal systolic murmur was still present. At the apex it was rumbling in character, without a definite diastolic murmur. A third heart sound was present. The tip of the spleen was questionably palpable. There was a suggestion of clubbing of the fingers. No petechiae were seen. Blood cultures continued to be negative. The serum nonprotein nitrogen was 38 mg. per cent. A chest plate three days later showed the diaphragm higher in position than previously but incompletely outlined due to fluid in both pleural cavities. There was marked increase in pulmonary congestion. The heart was probably increased in size; the lower borders could not be outlined. During these three days there had been a gradual return of dependent edema, nocturnal dyspnea and dyspnea on the slightest exertion in bed. Dullness was present up to the scapulae, and there were scattered rales. Liver dullness extended 3 cm. below the costal margin, but the liver was not palpable. The spleen was definitely palpable. The temperature was 98.6°F., the pulse 70 and the respirations 20. The blood red-cell count was 2,500,000, with 50 per cent hemoglobin, the white-cell count 8000. The urine still contained many red cells and casts. An electrocardiogram showed less inversion of the T wave.

On the thirty-ninth hospital day the heart had enlarged still more and there were regularly recurring extrasystoles. A_2 was greater than P_2, and the harsh systolic murmur still extended into the neck, with no thrill. Congestion had increased, and dependent edema extended to the knees. The serum nonprotein nitrogen was 40 mg. per cent, and the serum protein 4.8 gm. On the fifty-fourth day the patient developed sym-

metrical skin lesions of the forearm and thighs, with itching, but they seemed to be of an irritative nature, probably related to soap, alcohol or other agents. Six days later the aortic systolic murmur was noted to be very loud and there was an associated thrill. Clubbing of the fingers was more definite. There were at this time signs of fluid in the abdomen. On the sixty-fourth day the serum protein of the blood was 4.96 gm. per cent — 2.42 albumin and 2.54 globulin. Congestive symptoms gradually increased, and nocturnal dyspnea became more marked. Blood and urine findings remained unchanged. He died during his tenth week in the hospital.

Differential Diagnosis

Dr. Edward F. Bland: This is a long record, but even so there are still a few additional things which we should like to know. Perhaps it is best that we do not know them. First, nothing is said about the past history; therefore, I think it legitimate to assume that it has no bearing on this patient's fatal illness. We should like to know especially if he had had rheumatic fever in the past; what his previous cardiovascular findings had been; whether his diet had been adequate; and whether he had been exposed to chemical irritants, drugs or otherwise. Then there are certain special studies not mentioned which might have been helpful in clarifying this puzzling illness. Nothing is said about the eyegrounds, so I suppose they were normal. There is only one blood-pressure determination recorded here. Both the systolic and the diastolic levels were on the low side, but not particularly striking. We must assume that the blood pressure did not increase significantly as his disease progressed. Finally, I should like to know about his treatment, particularly whether digitalis and diuretics were tried.

My impression of these x-ray films is that there is evidence suggesting enlargement of the liver, possibly due to congestion and that the kidneys are not shrunken but slightly increased in size, with some impairment of function. The heart is as described — slight to moderate increase in the region of the left ventricle without other characteristic changes.

On the basis of the positive information which has been given, it is evident that this patient had a slowly progressive subacute process of three and a half months' duration, with initial renal impairment and ultimate circulatory failure. I think there can be no reasonable doubt but that this patient had subacute nephritis with edema. The abrupt onset following a respiratory infection is characteristic of its initial stage. The distribution of the edema at the onset without evidence of circulatory failure, as well as the subsequent urine and blood studies are consistent with this diagnosis. As his disease progressed he later developed circulatory failure. The essential problem involves a decision as to whether the nephritis and heart failure are manifestations of a single clinical entity or whether this patient died primarily of renal disease.

Could all of this be on the basis of rheumatic fever? I think not, in spite of the suggestive onset following a cold associated with painful joints. Only the ankles and feet are mentioned, but they were also swollen so that they might have been tender on that account. There is nothing else during the subsequent course of his illness, except obscure symptoms of heart failure, to warrant a further consideration of rheumatic fever. The systolic murmur at the base of the heart I am inclined to think might have been due largely to his increasing anemia. Moreover, I do not believe he had a bicuspid aortic valve with a superimposed sclerosing process. If he had had an acute aortic valvulitis due to either a rheumatic or a bacterial infection I should expect at least a slight diastolic murmur in addition to the systolic one. Furthermore the electrocardiogram showed no auriculoventricular conduction disturbance which is fairly common in people with fatal rheumatic fever at this age. I prefer to discard rheumatic fever as being responsible for this man's illness.

Is this subacute bacterial endocarditis? Both the abruptness and the presenting symptoms at the onset are against it. It is to be noted that with the appearance of the edema he had a little fever, but this was never striking and the pulse remained rather slow to the end. The degree of renal involvement seems too much to be entirely accounted for by embolic nephritis, especially in the absence of recognizable embolism elsewhere.

If we could assume that he had subacute bacterial endocarditis, the later appearance of the palpable spleen is in accord, but it might have appeared because of other factors. The clubbing of the fingers became "more definite." That is all that is said subsequent to the previous comment of a "suggestive" clubbing, and I am still a little uncertain as to the significance of these statements. For my purpose in this discussion I should much prefer the fingers not to be clubbed. The repeatedly negative blood cultures are strong evidence against subacute bacterial endocarditis; they do not rule it out, however. There were no striking changes in the auscultatory findings in the heart, although the systolic murmur became somewhat louder and a thrill appeared over the base of the heart. He had a fairly high degree of secondary anemia, and I am inclined to think this

might have been responsible for these changes which, if due to a bacterial process, would almost certainly have been accompanied by a diastolic murmur. I will discard the diagnosis of bacterial endocarditis.

Did he have disseminated lupus erythematosus? I do not believe that he did. He was a little too old. He did, however, have fluid in the various serous cavities, as well as vague joint discomfort. We are told that the skin lesions on the arms and legs were probably due to physical agents and not to his disease. We see lupus now and then without skin lesions, at least during a major portion of the illness. Occasionally the patient dies before the characteristic lesion appears, but after further thought I am forced to throw out lupus erythematosus. Furthermore we have no reason to believe that he had any gross irregularities in his diet, nor do I think he had so-called nephrosis. There were too many cellular elements in his urine, and his illness did not last long enough.

Finally, I am left with primary subacute nephritis with edema which I think most nearly explains the course of this patient's illness. It is of some interest to speculate as to why the heart ultimately failed if this is the only explanation. The electrocardiogram suggests underlying coronary disease, possibly an old infarct, but we cannot be certain of this since the patient was obviously quite ill at the time the record was taken and we see T-wave changes suggestive of coronary disease in toxic states. I shall be surprised if he had serious aortic valvular disease although there may be minimal sclerosis at the aortic orifice.

"On the thirty-first hospital day the harsh basal systolic murmur was still present. At the apex it was rumbling in character, without a definite diastolic murmur." This description is difficult to interpret fully. We do not ordinarily consider systolic murmurs rumbling in character, and the next statement says that a third heart sound was present. I wonder if the sum total of this was that he developed a gallop rhythm audible at the apex. Perhaps the increasing anemia was a factor, superimposed on changes secondary to coronary disease sufficient to cause ultimate dilatation and failure of the heart. I believe, however, that this patient died primarily of subacute nephritis with edema, complicated by secondary heart failure of undetermined etiology.

Dr. James H. Means: I saw this man only at Grand Rounds. I cannot remember the patient well but I did make a note. Apparently the clubbed fingers impressed me as being definite. I thought he had very little evidence of bacterial endocarditis. I raised the question of whether he might have a nutritional factor. I did not believe that the fever was altogether explainable on the basis of lupus erythematosus, or that he had cardiac insufficiency at that time. That was a long time before he died.

Dr. William B. Breed: I think the doubt that Dr. Bland himself expressed regarding the rapid heart failure in the absence of hypertension or any demonstrable heart disease is significant. I should like to emphasize that and recall it to his attention. How could that be explained?

Dr. Tracy B. Mallory: A few years ago Dr. Earle M. Chapman x-rayed a series of cases with acute glomerulonephritis with the idea of accurately ascertaining the size of the heart. He found that it was almost uniformly dilated during the acute stage but shrank to normal size afterward.

A Physician: Most cases of this sort have some degree of hypertension.

Dr. A. Thornton Scott: I do not believe that the x-ray gives a true picture of how big the heart was in this patient. The apex impulse was in the anterior axillary line in the seventh interspace, below the area seen in the picture. It was also striking how this murmur was brought out. It was a loud murmur transmitted into the neck.

Dr. Bland: His aortic second sound was mentioned two or three times as being fairly good, which is against an important degree of stenosis. I wonder if he accumulated some fluid in the pericardium: he had considerable elsewhere. No friction rub was heard at any time, however. I have seen a few children with acute renal and myocardial failure following a severe streptococcal sore throat associated with marked enlargement of the heart. They usually have an elevated blood pressure. They have both acute renal and myocardial failure, but at postmortem show relatively little change in the myocardium.

Dr. Means: I do not believe the clubbed fingers can be dismissed so lightheartedly. He had a very harsh systolic murmur at the base going up into the neck. Dr. Bland seems to minimize the significance of that.

Clinical Diagnoses

Subacute bacterial endocarditis.
Acute glomerulonephritis.
Aortic stenosis with congestive failure.
Coronary occlusion and cerebral embolism.
Lupus erythematosus with verrucous endocarditis.

Dr. Bland's Diagnoses

Subacute nephritis with edema.
Myocardial failure of undetermined origin.

Anatomical Diagnoses

Calcareous aortic stenosis.
Subacute bacterial endocarditis?
Subacute glomerulonephritis.
Infarcts of spleen and kidneys.
Chronic passive congestion.
Edema.

Dr. Mallory: The autopsy showed some of the things expected and another point which I found very interesting. He certainly had an acute diffuse nephritis. The pair of kidneys together weighed 525 gm., which is almost twice normal. They were very pale. The capsules stripped easily, and there were two gross infarcts in them. On microscopic examination they showed a well-marked diffuse glomerular lesion. All the glomeruli showed changes. On the other hand none of the glomeruli showed advanced changes. Almost all had patent capsules; almost all contained red cells. The tubules showed very extensive degeneration, which is usually the case in patients who have a very marked nephrotic syndrome such as I think it is fair to say this patient had.

The heart proved extremely interesting. It weighed 725 gm., and the aortic valve was a little different from any I have ever seen before. It showed large shaggy masses of vegetation which must have produced a severe grade of stenosis. These were partly calcified and partly consisted of soft, friable thrombi of varying age. Now one of the unsolved problems of cardiac pathology is the etiology of the calcareous aortic stenosis that we see in elderly people. One ordinarily sees it only in a very advanced and what must be regarded as a healed form, and one is most apt to meet it in patients older than this one was. Perhaps the commonest age distribution is between sixty-five and seventy-five, whereas this patient was only fifty-two. It is therefore possible, it seems to me, that the lesion in this patient represents the initial or formative stage of senile calcareous aortic stenosis. It is also quite possible to interpret the picture as calcareous aortic stenosis of long duration with a superimposed bacterial endocarditis which had ulcerated into it. After very careful study microscopically I still cannot decide between these two alternatives. We could not find any bacteria in the vegetations by stain, and our postmortem blood cultures were negative, just as our antemortem ones were. The vegetation showed microscopically some inflammatory reaction of a type which cannot be considered specific since it is seen not only in rheumatic lesions but also in many cases of subacute bacterial endocarditis. I do not believe one can distinguish on that ground. The myocardium, of which we cut at least a dozen blocks, showed no lesion that could be considered an Aschoff nodule. It did show multiple foci, of varying age, of absorption of muscle fibers. We see similar lesions in subacute bacterial endocarditis fairly often. Where then do we stand? This may be subacute bacterial endocarditis implanted on an old calcareous aortic stenosis. If so it seems to be in the so-called "bacteria-free" stage of the disease. Undoubtedly this is the most conservative interpretation. On the other hand it is possible that this represents the early, progressive stage of calcareous aortic stenosis, a lesion as yet undescribed in pathological literature. The possibility is an intriguing one.

Dr. Bland: What about the extensive nephritis?

Dr. Mallory: One occasionally sees a diffuse glomerulonephritis in association with subacute bacterial endocarditis. That is not the usual picture of course. At least nine cases out of ten show a focal embolic nephritis. I am sure that less than 10, probably only 5, per cent show diffuse nephritis.

Dr. Means: Could we have thrown light by studying the antibody situation in regard to the streptococcus. Dr. Chester S. Keefer* made a report on cases in the bacteria-free stage and found that they had a very much higher titer of antibody than the ones with positive blood cultures.

Dr. Mallory: That might have been an interesting thing to do. One thing that would have thrown light would have been an x-ray of the aortic valve specifically taken to show calcareous deposits. I think there is little doubt they would have been visible.

Dr. Bland: The lesion must have been present for a long time, but the patient died primarily of an active disease process in the heart and the kidneys of three and a half months' duration, irrespective of the calcium.

Dr. Mallory: I still think it is impossible to be certain whether this aortic lesion represented two separate superimposed lesions or whether it was the active stage of one lesion.

Dr. Means: Could any other disease give clubbed fingers except bacterial endocarditis?

Dr. Mallory: I cannot say that we have found anything else to account for them.

*Keefer, C. S.: Subacute bacterial endocarditis; active cases without bacteremia. Ann. Int. Med. 11:714-734, 1937.

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A YEAR-ROUND DIVIDEND

Dividends are going to be declared this Christmas. They are dividends that are paying off in the knowledge that a grand humanitarian job has been well done. Doubly well-done, too, for the person who purchased Christmas Seals in 1937 has brought cheer and hope to thousands of men, women and children — cheer to those who are ill with tuberculosis; well-founded hope to those who wish to protect their homes from this once deadliest of all diseases. A purchaser of seals gets a feeling of great satisfaction in his knowing that he has an important part in a winning crusade.

This cheer, this hope, on the part of the receivers, this satisfaction on the part of the giver, all hinge around the Christmas Seal. If a person were able to follow figuratively his dollar or two with which he purchased seals, he would have to hustle at top speed, three hundred and sixty-five consecutive days and nights, in order to keep pace with the accomplishments his generosity has made possible. Seals combined with seals, dollars combined with dollars, are paving a one-way highway to health.

Medical research is just one important accomplishment. In addition, there are sanatoriums filled with men, women and children who are looking forward, cheerfully, to the day when they will be discharged. Christmas Seals have been a vital factor in taking the deadliness out of tuberculosis. In a sanatorium a person gains the upper hand over the bacilli that, not so many years ago, meant certain, and oftentimes quick, death. Thanks to the Christmas Seal, people are learning more and more about tuberculosis — its cause, cure and prevention; they are taking advantage of this knowledge, and homes are healthier and happier than they have been in the past.

Another dividend in health and happiness will be payable a year from now if people will purchase Christmas Seals. In fact, such dividends are being paid every single day of the year — dividends to those ill with tuberculosis and dividends to the buyer of Christmas Seals.

BROADER PROGRAM NEEDED TO STAMP OUT SYPHILIS

The Public Affairs Committee of New York City, which is publishing a series of factual pamphlets on current problems, has just issued *Behind the Syphilis Campaign*. This pamphlet points out that an expanded public-health program carrying an appropriation of at least $25,000,000 annually for ten years for venereal disease control would stamp out syphilis in this country as it has already been eliminated in Sweden.

This cost is contrasted with the small amount now being spent in syphilis-control activities, as well as the much larger amount now spent to repair the damage done by the disease. Public expenditures for the care of the victims of the disease are shown to be at least $41,000,000, or more than the amount needed to stamp it out. In addition to public expenditures, syphilis costs huge but unknown sums in medical bills, disability and premature death.

It was not until 1934, the pamphlet points out, that "we were able for the first time to say how much syphilis there was in the United States. In 1935 we were able to say for the first time just

how effective modern treatment was and to recommend a standardized and highly perfected system of treatment. In 1936 the tests for the laboratory diagnosis of syphilis were brought to a new perfection."

Industry is urged, in its own interest, to co-operate in protecting the health of its workers. Infected employees should in no case be discharged to spread disease in the community. Unless competent treatment can be arranged through private physicians, at prices the workers can afford, it is recommended that industrial medical services treat syphilis, such treatment being extended as part of the regular medical services. Similar co-operation is sought from labor unions.

Instead of utilizing the old-fashioned, dubious appeal of fear, the present-day campaign against the disease strives to inculcate confidence. To this end it promises a high degree of success if the following eight-point program formulated by an advisory committee of the United States Public Health Service is carried out:

1. A trained public-health staff in every community headed by a full-time medical officer.
2. The reporting of all cases and vigorous follow-up where treatment has lapsed.
3. Adequate treatment facilities which provide the best of modern treatment for all, including those who cannot afford to pay.
4. Adequate laboratory facilities which permit the performance of blood tests for physicians and clinics without charge.
5. Free antisyphilitic drugs to all physicians and clinics.
6. Medical certificates, including a negative test before marriage.
7. The inclusion of a blood test as a part of every routine physical examination.
8. An educational program aimed at the age groups which most frequently acquire syphilis.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

RAYMOND S. TITUS, M.D., *Secretary*
330 Dartmouth Street
Boston

PLACENTA ACCRETA AT TERM

Mrs. M. B., a twenty-seven-year-old gravida IV, was admitted to the hospital March 19, 1932, after a precipitate full-term delivery at home. She was sent to the hospital three and a half hours after delivery because the placenta had not been delivered. One-half cc. of posterior pituitary extract had been injected intravenously after the Credé maneuver had been unsuccessful, and still the placenta remained in situ. There had been no frank postpartum hemorrhage, although moderate bleeding had persisted after the birth of the baby.

The family history was essentially negative, as was the patient's past history. She had had three normal pregnancies and deliveries. Catamenia began at fourteen and had always been normal, with a twenty-eight-day cycle, the last period having begun on May 10, 1931.

Physical examination revealed a somewhat pale, apprehensive woman lying comfortably in bed. She was well-developed but poorly nourished. The heart was normal; there was no enlargement or murmurs. The lungs showed no rales and no areas of dullness. The pulse rate was 110, and the blood pressure 66 systolic. Abdominal palpation revealed a tumor consistent with the uterus, which rose from the symphysis to within two and a half fingers of the umbilicus. This mass was firm and non-tender. The stump of the umbilical cord protruded from the vagina. Continued bleeding made it necessary to explore the uterus in order to determine which type of retained placenta existed. (Had there been no bleeding, intrauterine manipulation might have been postponed.)

Because of the patient's pulse and blood pressure she was given 700 cc. of 5 per cent glucose solution intravenously. Under strict asepsis and nitrous-oxide, oxygen and ether anesthesia the uterus was explored. No plane of cleavage between the placenta and the uterine wall could be found. This meant a complete placenta accreta. Transfusion was therefore started, and laparotomy performed. There was no free fluid in the abdominal cavity; a supracervical hysterectomy was done. The abdomen was closed without drainage. The patient reacted well to transfusion and to the hysterectomy, but later in the day another transfusion was deemed advisable and accordingly performed.

The patient had a mild febrile convalescence for ten days and was discharged on the nineteenth day with a well-healed abdominal wound.

The pathological report was as follows: Gross examination revealed a postpartum uterus with the placenta partially separated at its lower margin. Fine strands of tissue seemed to hold the placenta firmly attached to the uterine wall. Microscopic examination showed a placenta accreta. The decidua was thin or absent except in the decidual septa where it appeared normal. In some areas only a thin zone of fibrinoid material separated

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

placental tissue from uterine muscle. The maternal sinusoids were found for the most part within muscle tissue, so that the spongy layer of the decidua was largely missing. The underlying lesion was not an invasion of the normal muscle layers but rather an absence or scanty amount of normal decidua in which the villi could become anchored.

Comment. All placenta accretas are retained placentas but many retained placentas are not accretas. The differentiation can be made solely by intrauterine examination. Some accretas do not bleed, but as soon as there is any separation, bleeding occurs, and will continue because the change in histologic structure is such that it is impossible for the uterine sinuses exposed by partial separation to be closed by contracture. The degree of shock that these patients demonstrate depends entirely on the amount of bleeding that has occurred. This particular case would have benefited by a transfusion earlier, but perhaps it was not done because no donor was at hand.

When intrauterine manipulation reveals a placenta that is entirely adherent and no plane of cleavage can be obtained, the diagnosis of accreta is justified and hysterectomy is indicated. True accretas cannot be removed manually, and such an attempt usually results in traumatic rupture of the uterus. It must be appreciated that a placenta accreta is always possible in any case of retained placenta and that life will be saved, when this diagnosis is made, by discarding all attempts at manual removal and performing a hysterectomy. All such cases should be matched for transfusion before operative procedures are undertaken. At the time of intrauterine examination in any case of retained placenta, the operating room should be prepared for a laparotomy so that there will be no delay if the diagnosis of accreta is made.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning December 5:

BRISTOL SOUTH (New Bedford Section)

Friday, December 9, at 4:00 p. m., at the St. Luke's Hospital, New Bedford. Subject: Bleeding in the Third Trimester of Pregnancy. Instructor: De Los J. Bristol, Jr. Robert H. Goodwin, *Chairman.*

ESSEX NORTH

Friday, December 9, at 4:30 p. m., at the Lawrence General Hospital, Lawrence. Subject: Syphilis — Latent Syphilis — Diagnosis and Treatment. Instructor: William P. Boardman. John Parr, *Chairman.*

ESSEX SOUTH

Tuesday, December 6, at 4:00 p. m., in the Nurses' Home of the Salem Hospital, Salem. Subject: Bright's Disease and Hypertension — Evaluation of New Therapy: Diagnosis. Instructor: W. Richard Ohler. Walter G. Phippen, *Chairman.*

HAMPSHIRE

Wednesday, December 7, at 4:15 p. m., in the Nurses' Home of the Cooley Dickinson Hospital, Northampton. Subject: Obstetrical Examination. Instructor: Robert L. DeNormandie. Warren P. Cordes, *Chairman.*

NORFOLK SOUTH

Monday, December 5, at 8:30 p. m., at the Quincy City Hospital, Whitwell Street, Quincy. Subject: Heart Disease — The Treatment of "Heart Attacks" or "Cardiovascular Emergencies." Instructor: Edward F. Bland. David L. Belding, *Chairman.*

PLYMOUTH

Tuesday, December 6, at 4:00 p. m., in the Rosa Field Nurses' Residence, Brockton Hospital (rear of hospital), Brockton. Subject: Anemia — Modern Methods in Diagnosis and Treatment of Blood Dyscrasias. Instructor: George R. Minot. Walter H. Pulsifer, *Chairman.*

WORCESTER

Tuesday, December 6, at 8:30 p. m., in the Nurses' Home of the Milford Hospital, Milford. Subject: The Indications and Contraindications for Removal of Tonsils and Adenoids. Instructors: James M. Baty and Carlyle G. Flake. Joseph Ashkins, *Chairman.*

WORCESTER NORTH

Friday, December 9, at 4:30 p. m., at the Burbank Hospital, Fitchburg. Subject: Heart Disease — The Treatment of "Heart Attacks" or "Cardiovascular Emergencies." Instructor: Paul D. White. George P. Keaveny, *Chairman.*

CORRESPONDENCE

AN UNSPONSORED "POSTGRADUATE COURSE"

To the Editor: We have your telegram reading:

> Massachusetts physician circularized by announcement of course of lectures on injection treatment by Dr. R. A. Winters of Chicago. Would appreciate information regarding Dr. Winters. Kindly reply by wire collect.

We immediately wired you the following reply:

> Doctor inquired about neither member nor fellow A. M. A. No record here of any special surgical training. Has promoted alleged diabetes cure. Letter follows.

We are sorry to say that we do not know what medicaments are contained in the injections that Dr. Russell A. Winters recommends in the treatment of hemorrhoids, varicose ulcers, hernia, varicocele, and so forth, in the "courses" he gives physicians. An inquiry that another physician sent us on the same subject a few weeks ago states that he obtains his "materials" from the Farnsworth Laboratories of Chicago. We told him that the American Medical Association has recognized nothing put out by these laboratories. We dealt with this concern and one of its drugs, Alphacatalyst, in *The Journal,* May 19, 1928, and you will find a modified reprint of that article given in our pamphlet *Cancer Cures and Treatments.*

In August, 1933, a government department told us that

at the Farnsworth address a concern called the Diatone Company was putting out an alleged diabetes cure, Diatone. Later we were told that the Diatone concern moved to 765 Oakwood Boulevard, and it appears that R. A. Winters was connected with it at both addresses. For a time the concern used as part of its advertising an article by Winters entitled "Diabetes Mellitus."

The local office of the Food and Drug Administration told us that when one of its inspectors, in May, 1936, visited Winters' downtown office, at 5 North Wabash Avenue, to discuss the government's investigation of him, Winters claimed to have used Diatone on three or four dozen patients over a period of a few years, with good results. He could, however, furnish no written records of these cases.

When the same inspector again visited the man's office in October, 1936, Winters is said to have told him that in October, 1934, he moved to Fort Wayne to establish a general practice, and not intending to return to Chicago, he destroyed all his case records, including the Diatone reports. Later he admitted that he had not destroyed his records but had packed them away and that they had got lost.

The same inspector reported in March, 1937, that Diatone, Incorporated, had gone out of business, having filed a notice of dissolution on March 18 of that year with the city-corporation file, but that apparently the drug Diatone was being put out under the guise of something the Farnsworth Laboratories was exploiting as Colluranium (colloidal uranium). Our informant further told us that, at 5 North Wabash Avenue, Winters shared quarters with a "Dr." Myrtle Farnsworth, who, our records showed, was not a doctor of medicine, but ran what appears to have been a patent-medicine business. She was said to be the wife of Merle Farnsworth, who is back of the Farnsworth Laboratories mentioned above.

According to our records, Winters was born in 1901 and was graduated from Loyola University School of Medicine in 1928. He is not a member of the Chicago Medical Society or a fellow of the American Medical Association. Dr. Winters is said to be dean of the American College of Physical Therapy, 5 North Wabash Avenue, Chicago, an organization owned by laymen which has, for its main function, the training of technicians in massage, electrotherapy, colon therapy, physical therapy, and so on. This place has been investigated by our Council on Medical Education and Hospitals and found to be unsuitable for recognition as a training school for physical therapy technicians.

PAUL C. BARTON, *Director*,
Bureau of Investigation,
American Medical Association.

535 North Dearborn Street,
Chicago.

The above letter was received too late for publication in the November 24 issue of the *Journal*. Dr. Winters' postgraduate course has been given; we wonder how many New England physicians were gullible enough to attend. — *Editor.*

NOTICES

TUMOR CLINIC, BOSTON DISPENSARY

Each Tuesday and Friday morning from ten to twelve-thirty there is a meeting of the Tumor Clinic of the Boston Dispensary, a unit of the New England Medical Center. All kinds of tumors are seen, discussed, and when indicated, treated with radium and high-voltage x-ray.

Physicians are welcome to visit this clinic and bring patients for diagnosis.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, DECEMBER 5

MONDAY, DECEMBER 5

*4 p. m. Physicians and medical students are cordially invited to attend a clinic presented by the medical, surgical and orthopedic services of the Infants' and Children's hospitals, in the amphitheater of the Children's Hospital.

TUESDAY, DECEMBER 6

*9-10 a. m. Boston Dispensary. Diagnosis and Treatment of Acute Pancreatic Disease. Dr. J. H. Pratt.

*10 a. m. - 12:30 p. m. Tumor clinic. Boston Dispensary.

8:15 p. m. Greater Boston Medical Society. Beth Israel Hospital auditorium.

WEDNESDAY, DECEMBER 7

*9-10 a. m. Boston Dispensary. Hospital case presentation. Dr. S. J. Thannhauser.

*11:30 a. m. - 12:30 p. m. Psychiatric Conference. Boston City Hospital. Nerve Conference Room, 6th floor, Out-Patient Department.

*12 m. Clinicopathological conference. Children's Hospital amphitheater.

THURSDAY, DECEMBER 8

8:30 9:30 a. m. Exchange visit, Surgical and Orthopedic Staffs of the Peter Bent Brigham and Children's hospitals, held this week at the Children's Hospital Surgical.

*9-10 a. m. Boston Dispensary. Medical-Social case presentations of Social Service Department. Dr. I. Olef and members of the Social Service Department.

*10:30 a. m. Psychiatric Rounds. Boston City Hospital. Rounds will start at Room 916 on the ninth floor of the Medical Building.

FRIDAY, DECEMBER 9

*9-10 a. m. Boston Dispensary. Iodine in Relation to Thyroid Disease. Dr. W. T. Salter.

*10 a. m. - 12:30 p. m. Tumor clinic. Boston Dispensary.

SATURDAY, DECEMBER 10

*9-10 a. m. Boston Dispensary. Hospital case presentation. Dr. S. J. Thannhauser.

*10 a. m. - 12 m. Staff rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian.

*Open to the medical profession.

DECEMBER 6 — Greater Boston Medical Society. Page 863, issue of November 24.

DECEMBER 6 — Lawrence Cancer Clinic. Page 814, issue of November 17.

DECEMBER 8 — Pentucket Association of Physicians, 8:30 p. m., Hotel Bartlett, 95 Main Street, Haverhill.

JANUARY 12, 1939 — Peter Bent Brigham Hospital. Clinic conducted by Dr. Christian. Page 633, issue of October 20.

FEBRUARY 4, MAY 15 and 16, 1939 — American Board of Obstetrics and Gynecology. Page 451, issue of September 22. *(Application for admission to Group A examinations must be on file in the Secretary's office by March 15, 1939, instead of April 1 as previously stated.)*

MARCH 27-31 — American College of Physicians. Page 36, issue of July 7.

MAY 7-15 — International Congress of Military Medicine and Pharmacy. Page 501, issue of September 29.

MAY 15-19 — American Medical Association, St. Louis, Missouri.

JUNE 6, 7, 8 — Massachusetts Medical Society. Worcester.

SEPTEMBER — Boston Psychoanalytic Institute. Page 450, issue of September 22.

SEPTEMBER 15-28 — Pan-Pacific Surgical Association. Page 863, issue of November 24.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH

DECEMBER 7 — Salem Hospital. Clinic at 5 p. m. Dinner at 7 p. m. Speakers: Dr. Walter G. Phippen and Dr. Channing Frothingham. Subject: Economic Problems.

JANUARY 4 — Danvers State Hospital. Clinic at 5 p. m. Dinner at 7 p. m. Speaker: Dr. Kenneth J. Tillotson. Subject: The Psychiatrist's Viewpoint in Delinquency.

FEBRUARY 8 — Essex Sanatorium, Middleton. Clinic at 5 p. m. Dinner at 7 p. m. Speaker: Dr. Edward Churchill. Subject: Surgical Treatment of Pulmonary Suppuration.

MARCH 1 — Lynn Hospital. Clinic at 5 p. m. Dinner at 7 p. m. Speaker: Dr. John Rock. Subject: Endocrinology.

APRIL 5 — Addison Gilbert Hospital, Gloucester. Clinic at 5 p. m. Dinner at 7 p. m. Speaker: Dr. Ethan Allan Brown. Subject: Allergy.

MAY 10 — Annual meeting. Salem Country Club, Peabody.

SUFFOLK

JANUARY 25, 1939 — Symposium on Diabetes. Dr. Elliott P. Joslin and associates, Boston Medical Library, 8:15 p. m.

MARCH 29 — Joint meeting with New England Pediatric Society, Boston Medical Library, 8:15 p. m. Program and speakers to be announced.

APRIL 26 — Annual meeting in conjunction with Boston Medical Library, at 8:15 p. m. Election of officers. Program and speakers to be announced.